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OHIO STATE UNIVERSITY
BULLETIN

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GRADUATE SCHOOL

1943 - 1944

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GRADUATE SCHOOL

1943-1944

THE OHIO STATE UNIVERSITY
COLUMBUS

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UNIVERSITY CALENDAR

1943

SUMMER QUARTER

June 21 to 28	Physical Examinations for all new students.
June 21	Latest day for registration and payment of fees before classes begin. (See page 17.)
June 22	Classes begin, 8:00 A.M.
June 26	Intelligence Test for all new students.
July 4	Independence Day. (July 5, no classes.)
July 26, 27, 28	Final Examinations, first term only (at regular class hours).
July 28	First term ends, 6:00 P.M.
July 29	Second term begins, 8:00 A.M.
July 31	Intelligence test for all new students.
August 31, September 1, 2, 3	Final Examinations.
September 3	Summer Convocation (Commencement), 9:00 A.M.
September 3	Summer Quarter ends, 6:00 P.M.

AUTUMN QUARTER

September 22 to 27	Freshman Week.
September 27	Physical Examinations for students other than Freshmen.
September 27	Latest day for registration and payment of fees before classes begin. (See page 17.)
September 28	Classes begin, 8:00 A.M.
October 2	Intelligence Test for all new students other than Freshmen.
November 11	Armistice Day. No classes.
November 25	Thanksgiving Day. No classes.
December 14, 15, 16, 17, 18	Final Examinations.
December 17	Autumn Convocation (Commencement), 2:00 P.M.
December 18	Autumn Quarter ends, 6:00 P.M.

1944

WINTER QUARTER

January 3 to 7	Physical Examinations for all new students.
January 3	Latest day for registration and payment of fees before classes begin. (See page 17.)
January 4	Classes begin, 8:00 A.M.
January 8	Intelligence Test for all new students.
February 22	Washington's Birthday. No classes.
March 14, 15, 16, 17, 18	Final Examinations.
March 17	Winter Convocation (Commencement), 2:00 P.M.
March 18	Winter Quarter ends, 6:00 P.M.

SPRING QUARTER

March 27	Latest day for registration and payment of fees before classes begin. (See page 17.)
March 28	Classes begin, 8:00 A.M.
March 27 to 31	Physical Examinations for all new students.
April 1	Intelligence Test for all new students.
May 30	Memorial Day. No classes.
May 31	R.O.T.C. Review and Presentation of Commissions.
June 6, 7, 8, 9, 10	Final Examinations.
June 10	Alumni Day.
June 11	Baccalaureate Sermon.
June 12	Class Day.
June 12	Spring Convocation (Commencement).
June 12	Spring Quarter ends.
June 19	Summer Quarter (1944) begins.
September 1	Summer Quarter (1944) ends.
October 3	Autumn Quarter (1944) classes begin.

ADMINISTRATION

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Residence: Ohio State University Campus—UN-3148, Campus 274

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Residence: 1445 E. Broad St.—EV-3042

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Office: Chemistry Building—UN-3148; Campus 698
Residence: 198 16th Ave.—WA-1579

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Residence: 198 W. 11th Ave.—UN-4782

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Office: Administration Building—UN-3148; Campus 628
Residence: 2029 W. Lane Ave., Upper Arlington—KI-1339

Registrar, University Editor, Secretary of the University Faculty and of the Faculty Council.....EDITH D. COCKINS
Office: Administration Building—UN-3148; Campus 314, 459
Residence: 1580 Guilford Rd., Upper Arlington—KI-2726

University Examiner.....BLAND L. STRADLEY
Offices: 102 Administration Building—UN-3148; Campus 726
107 University Hall—UN-3148; Campus 341, 342
Residence: Canal Winchester—FR-7-4140

†Assistant to the President.....CARL M. FRANKLIN
Office: Administration Building—UN-3148; Campus 710
Residence: 61 W. 10th Ave.—UN-4679

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Residence: 1040 Elmwood Ave.—KI-5883

Comptroller.....CHARLES A. KUNTZ
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Residence: 265 E. Tulane Rd.—LA-3606

Cashier.....FLORIS D. HANE
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Residence: 373 18th Ave.—WA-1054

Dean of Men.....JOSEPH A. PARK
Office: 108 Administration Building—UN-3148; Campus 283
Residence: 1474 Doone Rd., Upper Arlington—KI-1702

Dean of Women.....ESTHER ALLEN GAW
Office: 215 Pomerene Hall—UN-3148; Campus 731
Residence: Canfield Hall, Campus—UN-3148; Campus 761

† Military leave.

THE GRADUATE SCHOOL

Dean.....ALPHEUS W. SMITH

Office: 309 Administration Building—UN-3148; Campus 717, 718
Residence: 232 16th Ave.—WA-1924

Dean Emeritus.....WILLIAM McPHERSON

Office: Chemistry Building—UN-3148; Campus 698
Residence: 198 16th Ave.—WA-1579

Secretary.....ALICE A. MORAN

Office: 309 Administration Building—UN-3148; Campus 717, 718
Residence: 987 Woodhill Drive—KI-6048

THE GRADUATE COUNCIL
1942-1943

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WALLACE R. BRODE, Ph.D., Professor of Chemistry
*FRANK L. CAMPBELL, D.Sc., Professor of Entomology
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J. RAYMOND DERBY, Ph.D., Professor of English
*WALTER L. DORN, Ph.D., Professor of History
GEORGE W. ECKELBERRY, M.A., C.P.A., Professor of Accounting
†WILLIAM L. EVERITT, Ph.D., Professor of Electrical Engineering
LEONARD W. GOSS, D.V.M., Professor of Veterinary Pathology
JOSEPH H. GOURLEY, Ph. D., Professor of Horticulture
CHARLES H. HANDSCHIN, Ph.D., Professor of German, Representing Miami University
FRED A. HITCHCOCK, Ph.D., Associate Professor of Physiology
THOMAS C. HOLY, Ph.D., Representing the Bureau of Educational Research
N. PAUL HUDSON, Ph.D., M.D., Professor and Chairman of the Department of Bacteriology
JOSEPH H. KOFFOLT, Ph.D., Professor of Chemical Engineering
EDWARD MACK, JR., Ph.D., Professor and Chairman of the Department of Chemistry
CHARLES E. MacQUIGG, E.M., Representing the Engineering Experiment Station
EARL N. MANCHESTER, B.A., University Librarian
DELBERT OBERTEUFFER, Ph. D., Professor of Physical Education
A. RAY OLPIN, Ph.D., Director, Industrial Research Foundation
WARD G. REEDER, Ph.D., Professor of Education
CARL R. ROGERS, Ph.D., Professor of Psychology
HOWARD FRANCIS SEELY, M.A., S.E., Professor of Education
HANS SPERBER, Ph.D., Professor of German
RUTH STREITZ, Ph.D., Professor of Education
LLEWELLYN H. THOMAS, Ph.D., Professor of Physics

Substituting for members on leave:

FOSTER R. DULLES, Ph.D., Professor of History, for Mr. Dorn
E. ALLEN HELMS, Ph.D., Professor of Political Science, for Mr. Aumann
DWIGHT MOORE DELONG, Ph.D., Professor of Entomology, for Mr. Campbell
ERWIN E. DREESE, E.E., Professor and Chairman of the Department of Electrical Engineering, for Mr. Everitt

* On leave.
† Military leave.

FELLOWSHIPS AND SCHOLARSHIPS AWARDED FOR THE YEAR 1942-1943

ELIZABETH CLAY HOWALD SCHOLARSHIP

ESTHER CARPENTER ..... Zoology

MARY S. MUELLHAUPT SCHOLARSHIPS

LOUIS WHITING HUTCHINS (Summer Quarter) ..... Zoology
FOLKE JOHNSON ..... Botany
ELTON FARNHAM PADDOCK ..... Botany
SAMUEL SASLAW ..... Bacteriology

THE EDWARD ORTON JUNIOR FOUNDATION FELLOWSHIP

ROBERT HAYNE THOMAS ..... Ceramic Engineering

JOHN A. BOWNOCKER SCHOLARSHIP

WILLIAM NOBLE LOCKWOOD ..... Geology

UNIVERSITY FELLOWSHIPS

FRANK GLENN AUSTIN ..... Education
MYER HOWARD CHETRICK ..... Chemical Engineering
WILLIAM GEORGE DORE ..... Botany
JAMES BENJAMIN HINKAMP ..... Chemistry
LUIS FELIPE MARTORELL-DAVILA ..... Entomology
WILLIAM SYLVESTRE PRICE ..... Romance Languages
BERNICE CATHERINE SHOR ..... Zoology

UNIVERSITY SCHOLARSHIPS

HILDA AUERBACH ..... English
RUTH ELIZABETH CLIFFORD ..... Social Administration
BERNARD INGERSOLL DUFFEY ..... English
RACHEL JANE HAMILTON ..... Psychology
CLEMENS LUDWIG HELLER ..... History
TERESA M. HENDERSON ..... Classical Languages
ALICE L. JAMES ..... Romance Languages
GERALD HOWARD READ ..... Education

S. B. PENICK COMPANY FELLOWSHIP

EUGENE STILLINGS ..... Horticulture

ALBERTA GARBER SCOTT FELLOWSHIP

MICHAEL HAKEEM ..... Sociology

JULIUS ROSENWALD FUND FELLOWSHIPS

HARRY JAMES GREEN ..... Chemical Engineering
WILLIAM D. VARNELL ..... Education

E. I. duPONT de NEMOURS & COMPANY FELLOWSHIP

DONALD F. SWINEHART ..... Chemistry

ALLIED DYE AND CHEMICAL CORPORATION FELLOWSHIP

EVAN FRANKLIN EVANS ..... Chemistry

ABBOTT LABORATORIES FELLOWSHIP

RONALD ROSHER ..... Chemistry

ROSES, INCORPORATED, FELLOWSHIP

WILLARD BRYANT ..... Horticulture

WESTMINSTER FOUNDATION SCHOLARSHIP

JANET M. SMALTZ ..... Speech

BATTELLE MEMORIAL INSTITUTE FELLOWSHIP

DUNBAR GOULD TERRY ..... Chemical Engineering

FRANKLIN H. PATTERSON MEMORIAL SCHOLARSHIP

MARTHA ANN WHELAN ..... Social Administration

JAMES E. HAGERTY SCHOLARSHIP

MILDRED S. ROSS ..... Social Administration

R. G. PATERSON SCHOLARSHIP

GEORGE H. PRATT ..... Social Administration

M. R. BISSELL, JR., SCHOLARSHIP

BILLIE MARIE MULLINS ..... Social Administration

MRS. CHARLES B. MANNING SCHOLARSHIP

HELEN CLARE KEYES ..... Social Administration

ERDIS G. ROBINSON SCHOLARSHIP

DORIS CLEVENGER CHRISTY ..... Social Administration

COMMUNITY CHESTS AND COUNCILS, Inc., SCHOLARSHIP

JOHN FRANCIS ARDNER ..... Social Administration

ANNA FULLER FUND FELLOWSHIP (Post-doctorate)

MORRIS FARBMAN ..... Chemistry

THE OHIO STATE UNIVERSITY

LOCATION

The Ohio State University is situated within the corporate limits of the city of Columbus. It is supported by appropriations from the State and Federal governments. The University has almost 1,800 acres of land with 400 acres in the campus, 400 acres in the University Airport, and 1,000 acres in the farm. The total value of land, buildings, and equipment is $27,301,655.68.

ORGANIZATION

For convenience of administration the departments of the University are grouped into organizations called Colleges. The Ohio State University comprises ten Colleges and a Graduate School, each under the administration of a Dean and College Faculty, as follows:

Graduate School, College of Agriculture (including the School of Home Economics), College of Arts and Sciences (including the School of Journalism and the School of Optometry), College of Commerce and Administration (including the School of Social Administration), College of Dentistry, College of Education, College of Engineering (including the School of Mineral Industries), College of Law, College of Medicine (including the School of Nursing), College of Pharmacy, College of Veterinary Medicine.

NOTE: Bulletins describing the work of the several Colleges may be obtained by addressing the University Examiner, The Ohio State University, Columbus, and stating the College in which the writer is interested. (For list of bulletins, see the last page.)

THE UNIVERSITY YEAR—FOUR QUARTERS

The University year is divided into four Quarters, each approximately eleven weeks in length. The Summer Quarter is further divided into two terms of approximately six weeks each. Complete courses that are so announced may be taken for either term or for the entire Quarter.

This *Bulletin* is devoted to the work of the Graduate School for the Autumn, Winter, and Spring Quarters, 1943-1944. The announcements for the Summer Quarter are printed in the Summer Quarter Bulletin.

THE GRADUATE SCHOOL

GENERAL INFORMATION

The office of the Graduate School is located in Room 309, Administration Building. The office is open from 8:00 a.m. to 12:00 and 1:00 to 5.00 p.m. daily, except Saturday. On Saturday, it is open from 8:00 a. m. to 12:00 m.

The offices of the President of the University, the University Examiner, the Registrar, and the Bursar also are located in the Administration Building.

ORGANIZATION AND ADMINISTRATION

The instruction and training of graduate students has been one of the functions of The Ohio State University since 1878, when the first graduate student was in residence. For a number of years the graduate work of the University was unorganized and each department conducted its own work with little reference to that of other departments. After the University was divided into colleges, each college controlled the graduate work offered in the various departments constituting that college. In 1902, however, the graduate work

within the College of Arts had assumed sufficient proportions to warrant the organization of a Graduate School to secure an effective and systematic arrangement of the graduate work of that college. Finally in 1911, there was organized the Graduate School of the University to administer all the graduate work offered in the several departments of the University. This School is under the administration of a Graduate Council consisting of thirty-three members. The membership of the Council is made up of the following: the Dean of the Graduate School, the Director of the Bureau of Educational Research, the Director of the Bureau of Business Research, the Director of the Engineering Experiment Station, the Director of the Industrial Research Foundation, a representative of the Ohio Agricultural Experiment Station, the University Librarian, twenty-seven members of the instructional staff appointed from among those departments offering graduate work in The Ohio State University, and a representative from the faculty of Miami University. This Council reports directly to the University Faculty, which is the legislative body of the Graduate School, as well as of the ten colleges.

All communications and inquiries regarding matters connected with the Graduate School, whether from prospective students or from those whose work is in progress, should be directed to the Dean of the Graduate School.

AGREEMENTS BETWEEN THE OHIO STATE UNIVERSITY AND OTHER INSTITUTIONS CONCERNING GRADUATE WORK

In order that certain educational and research institutions may be able to take advantage of the facilities of the Graduate School, and also in order that these institutions may be utilized for the pursuit of research work in connection with the Graduate School, agreements have been made between the Board of Trustees of The Ohio State University and the following institutions:

(a) **With Miami University.** Miami University is represented upon the Graduate Council of The Ohio State University. Part-time assistants connected with the instructional staff of Miami University may pursue their graduate work for the Master's degree at Miami University subject to the supervision of the Graduate Council of The Ohio State University, and upon the successful completion of the same will receive their degrees from The Ohio State University. Such students must be registered in the Graduate School of the Ohio State University while pursuing their work.

(b) **With the Ohio Agricultural Experiment Station.** Persons engaged in investigation at the Ohio Agricultural Experiment Station may register in the Graduate School of the University and the research work carried on at the Station by such persons may be counted towards a graduate degree under appropriate restrictions. All such cases, however, shall be considered individual and subject to detailed examination on the part of the Graduate Council. It is possible for a student to complete his work for the Master's degree in residence at the Station alone. For the Doctor's degree he must spend at least one year in residence at The Ohio State University. In all cases, however, the work of the students is carried on under the general rules and regulations of the Graduate Council and the final examinations must be taken at the University in the presence of representatives of the Experiment Station Staff and of the Graduate Council.

(c) **With the Merrill-Palmer School.** A graduate of The Ohio State University who has completed all the necessary undergraduate requirements may fulfill the residence requirement for the Master's degree by satisfactorily completing one Quarter of acceptable work in residence at The Ohio State University, and two additional Quarters of acceptable work in residence at the Merrill-Palmer School. Before entering the Merrill-Palmer School, the candidate must confer with the chairman of the department at The Ohio State University in which he wishes to specialize, under whose direction a general

course of study for the Master's degree will be arranged. The thesis subject must be of such character as to enable the candidate to carry on experimental work at the Merrill-Palmer School.

The final examination of the candidate will be conducted by a committee consisting of members of the instructional staff of this University together with representatives of the Merrill-Palmer School, according to the rules governing the Master's degree. The thesis must meet with the approval of both the Merrill-Palmer School and this University.

Students carrying on work at the Merrill-Palmer School under the above regulations must also register at the same time in the Graduate School of this University, but will not be required to pay fees in this University.

(d) **The Perkins Observatory.** The Perkins Observatory is jointly maintained and administered by the Ohio Wesleyan University and the Ohio State University. Its facilities are, therefore, available for students registered in the Graduate School desiring to pursue research work in astronomy or astrophysics.

The principal instrument of the Observatory is a large reflecting telescope, the mirror for which was cast by the Bureau of Standards and is the first large piece of optical glass made in this country. The reflecting surface measures 69 inches in diameter and offers an unusual equipment for astronomical and astrophysical research. There is an auxiliary photographic doublet for six-inch aperture, and a solar objective of 25 feet focal length.

The Observatory is also provided with auxiliary scientific equipment which will afford special facilities for photometric, spectroscopic, and radiometric investigations.

The main building houses the offices for the staff, a lecture room, a spacious library, research laboratory, photographic dark rooms, and an instrument shop for the construction of special apparatus.

Members of the scientific staff of the Observatory are also members of the staff of the Department of Physics and Astronomy. The facilities of the Mendenhall Laboratory of Physics and the Emerson McMillin Observatory are available as far as possible to supplement the facilities of the Perkins Observatory, and the staff of the Mendenhall Laboratory of Physics cooperates fully with the staff of the Observatory in the supervision and direction of research. Unusual opportunities are thus offered for graduate and research work in astronomy and astrophysics.

(e) **With the Bureau of Juvenile Research of the State of Ohio.** Students who are registered in the Graduate School of The Ohio State University and who are candidates for a Master's degree, specializing in Clinical Psychology, may do not to exceed one-third of the work required for this degree at the Bureau of Juvenile Research. All such work must be approved in advance by a professional member of the Clinical Division of the Department of Psychology, and all credits received for such work must be submitted under his signature.

Candidates for the degree of Doctor of Philosophy specializing in Clinical Psychology, may likewise carry on work at the Bureau of Juvenile Research. The amount of such work shall be determined in each individual case by a professional member of the Division of Clinical Psychology of the Department of Psychology and the Dean of the Graduate School, but in no case will this amount exceed one-third of the total requirements for the degree of Doctor of Philosophy.

Students carrying work at the Bureau of Juvenile Research must be registered in the Graduate School of this University during the time in which they are pursuing such work.

The Bureau of Juvenile Research offers a limited number of full-time interneships for qualified graduate students majoring in clinical psychology.

(f) **With the Battelle Memorial Institute.** Students who are registered in the Graduate School of The Ohio State University, specializing in certain

fields of engineering, especially in metallurgy, fuels and allied fields, may carry on their research work at the Battelle Memorial Institute. The credit for such work must be submitted under the signature of the professor in charge of the work, who must be a member of the appropriate department of the University.

(g) **With the Kettering Research Foundation.** The Ohio State University has entered into an agreement with the Kettering Research Foundation at Antioch College which makes it possible for candidates for the Ph.D. degree to carry out the research work essential for a dissertation at the Kettering Foundation. This work must be done under the general direction of the appropriate department in The Ohio State University.

The research work of the Kettering Foundation is directed largely to a study of chlorophyll and photosynthesis. Excellent opportunities are offered to those interested in these and related fields of biophysics, biochemistry and plant physiology. Ample facilities and a competent scientific staff are available. Such a program of research, when offered as a dissertation, must meet both the requirements and the standards of The Ohio State University and the Kettering Foundation.

Students may obtain as much as two years of residence for research carried out at the Kettering Research Foundation. They must, however, register simultaneously in the Graduate School of The Ohio State University. During this period they are exempt from all fees except the matriculation fee of $15.00 and the graduation fee when the degree is received. At least one year of residence must be spent at The Ohio State University doing the course work necessary for the Ph.D. degree. During this year of residence, the regular incidental, laboratory and tuition fees must be paid, unless the student has been appointed to a Kettering Research Foundation Fellowship with a stipend of less than $300 per Quarter.

Students registering under this plan must obtain the approval of the department concerned, must have an appointment at the Kettering Research Foundation and meet all the requirements for the Ph.D. degree as imposed by The Ohio State University.

(h) **With the Samuel S. Fels Institute for the Study of Prenatal and Postnatal Environment.** A cooperative agreement between the Graduate School of The Ohio State University and The Samuel S. Fels Institute for the Study of Prenatal and Postnatal Environment at Antioch College permits graduate students to complete the dissertation, in whole or in part, at the Fels Institute.

The Fels Institute is engaged in an important investigation of the environment and hereditary factors controlling child development. A considerable number of research projects are under way. Cooperative relations have been established with other research laboratories and institutions. Excellent research opportunities are provided for those interested in this field of science.

Students may earn as much as two years of residence while carrying on research at Fels Institute. They must, however, register simultaneously in the Graduate School of The Ohio State University. During this period they are exempt from all fees except the matriculation fee of $15.00 and the graduation fee when the degree is received. At least one year of residence must be spent at The Ohio State University doing the course work necessary for the Ph.D. degree. During this year of residence the regular incidental, laboratory and tuition fees must be paid, unless the student has been appointed to a Fels Institute Fellowship with a stipend of less than $300 per Quarter.

Students registering under this plan must obtain the approval of the Department of Psychology, must hold an appointment with the Fels Institute, and must meet all the requirements for the Ph.D. degree as imposed by The Ohio State University.

THE UNIVERSITY LIBRARY

The University Library consists of all books owned by the University and number over 624,000 volumes. The main part of the Library, which is known as the General Library, is housed in the Library Building. Very important divisions of the book collection are housed in other buildings. A catalog of the entire collection is maintained in the General Library.

Any person is privileged to use the University Library for reference, but books may be drawn for home use only by officers and registered students of the University. Graduate students may obtain a permit to use the stacks of the Library upon presentation of their fee cards at the office of the Librarian.

The University Library is a depository for the official publications of the United States and has a very complete collection of these documents. It also receives thousands of documents from states, cities, and foreign countries. The Library also possesses the British Parliamentary Papers including the rare early volumes. The numerous series of the publications of the League of Nations are well represented in the Library Collections. The exchanges of the Ohio Academy of Science, of the Ohio State University Scientific Association and of the Ohio Biological Survey are deposited in the University Library.

Through a gift from the Phi Eta Sigma fraternity, the General Library has established a rental library of significant current books for general reading. Its popularity suggests that this project fills a recognized need.

The University Library is a depository for the Library of Congress catalog.

Fourteen department libraries, organized divisions of the University Library, are in charge of library assistants.

The Botany and Zoology Library is located in the Botany and Zoology Building. The "Index to General Botanical Literature," the "Index to Algological Literature" and the card index to the Concilium Bibliographicum are in this departmental library.

Brown Hall Library, located in Brown Hall, contains collections of books on Architecture, Engineering Drawing, and Civil Engineering. The collection of plates filed in this library is especially valuable for students in Architecture.

The Charles Cutler Sharp Library is located in the Chemistry Building. It contains not only the current periodicals and a large collection of dictionaries and handbooks on chemistry, but also complete sets of all important journals dealing with subjects lying within the general field of chemistry and related sciences.

The Commerce Library, in the Commerce Building, includes a working collection of books for the undergraduate students in the College of Commerce. A large study room is maintained and also a reserve collection for student use.

The A. F. Davis Welding Library, in Room 200, Industrial Engineering Building, represents a bringing together from several sections of materials on welding in its various aspects. Through the courtesy of the James F. Lincoln Arc Welding Foundation the prize papers of the 1937-1938 Award Program have been deposited in this collection as a contribution to research in the field. The centralization of books in mechanics and industrial engineering, with the books on welding, will make this collection a center for engineering research.

The Education Library is located in Arps Hall. It is organized for graduate work and includes complete sets of important educational and psychological periodicals, city and state reports, textbooks, and other works of reference on educational and psychological subjects.

The Law Library is in Page Hall. It includes all of the United States and state reports, the English reports, the Irish reports, the latest statutes, codes and session laws of the states, complete sets of all the important legal periodicals and an up-to-date collection of text-books. It is especially well equipped for the study of Ohio law.

The Lord Hall Library consists of collections of books on Ceramics, Mining, Metallurgy, and Mineralogy and is located in Lord Hall.

The Medical and Dental Library is in Hamilton Hall. It consists of a working collection of books and periodicals. The historical books and many of the foreign periodical sets are shelved in the General Library.

The Orton Memorial Library, located in Orton Hall, is one of the finest geological libraries in the country. In addition, the Ohio Geological Survey deposits its document exchanges with the library. These two collections constitute a very complete set of official geological reports from the states, foreign governments, and scientific societies.

The Pharmacy-Bacteriology Library is located on the first floor of the Pharmacy and Bacteriology Building. It comprises files of journals and selected titles in pharmacy and bacteriology designed to furnish a reference collection for the students in these departments.

The Alfred D. Cole Memorial Library of Physics occupies three rooms in the Mendenhall Laboratory of Physics. The nucleus of the collection is the private library of Professor Cole. This library now contains not only current periodicals and selected books in the field of physics and astronomy but also complete sets of all important periodicals which are devoted to physics and its applications. Books and periodicals in the field of mathematics are also located in the Cole Memorial Library for the mutual convenience of the two departments. A memorial endowment fund contributed by the friends of Professor Cole provides for additions to this Library which cannot be secured from the regular Library funds for the maintenance of libraries.

The Social Administration Library is located on the fourth floor of the Social Administration Building. The library consists of texts, journals, serials, and particularly reports of Social Welfare Agencies selected from the University Collections and located in the Social Adminstration Library for the convenience of students and faculty in this field.

The Library of the College of Veterinary Medicine, located in the Veterinary Laboratory, contains approximately 2,000 volumes in this field, exclusive of a large collection of bulletins, reports, reprints, and other unbound and uncatalogued material.

Smaller collections selected with special reference to the needs of the various departments are housed near their offices. Collections of this type have been developed for Political Science, Room 100, University Hall, and Journalism on the second floor of the Journalism Building. The books relating to the Department of Fine Arts are collected in the Mantel Room in the General Library, where students have every facility for research.

The Library of the Ohio Archaeological and Historical Society, which is on the University Campus, is at the service of the officers and students of the University. This library is specializing in the history of Ohio and the Northwest and a very valuable collection is being built up. Its large newspaper collection is one of the most valuable in the Middle West.

The special library of Battelle Memorial Institute and the collections of the State Library are open to faculty and students of the University and supplement in important fields the collections of the University Libraries.

THE STATE LIBRARY

The State Library, consisting of approximately 600,000 volumes, is also available and is especially valuable in certain lines of work.

TEACHERS' PLACEMENT SERVICE

The Ohio State University maintains a Teachers' Placement Service for the convenience of the superintendents and boards of education of the State. Graduates and graduate students of the University are invited to enroll with the Appointments Office.

The Placement Service is under the direction of the Bureau of Educational Research. This service is rendered free of charge to the applicants. Graduates of experience who desire to better their locations are invited to communicate with the Appointments Office.

The Appointments Office has available such statistical information that advice and direction may be given in the matter of supply and demand for teachers in various fields.

Superintendents and boards of education are invited to state their needs to the Appointments Office. Prompt attention to all calls is assured.

GRADUATE STUDENT LOANS

A limited amount of money is available for loans to graduate students upon application to the Dean of Women or the Dean of Men. Loans are made only to those students who have been in residence in The Ohio State University for at least one Quarter. The maximum amount loaned in any one year to an individual is $100.00.

Phi Delta Gamma, graduate women's sorority, has available a loan fund for graduate women. Applications must be made to the President of Phi Delta Gamma.

UNIVERSITY HEALTH SERVICE
Hayes Hall

Medical Staff: Dr. J. W. Wilce, Director; Dr. M. F. Osborn, Dr. James A. Beer, Dr. Shirley Armstrong, Dr. Charlotte Winnemore, Dr. Earl H. Ryan, four occasional clinical and examination assistants, two specialized occasional consultants, four nurses, and one technician.

Office Hours. When the University is in session, daily 8:30 to 12:00 and 1:00 to 4:30; Saturdays, 8:30 to 12:00. Limited service, 12:00 to 1:00.

The objects of the University Health Service are:

(1) To protect, maintain, and improve the health of students by cooperation in and follow up of entrance examination; early diagnosis and control of all communicable conditions, in cooperation with other health agencies; individual health guidance, through personal conference; first aid and casual treatment of students on the campus; periodic health examinations for seniors, food-handlers, and special cases; consultant specialist service for certain cases; full cooperation with family physician, other physicians, and health agencies; centralized correlation of health agencies on the campus to best educational personnel ends; maintained emphasis on individual and group preventive medicine.

(2) To serve as the primary coordinating agency through centralized health records with university personnel officials in individual student health appraisal and health problems which involve the maintenance, discontinuance, or improvement of students' university relationships.

(3) To furnish a *limited degree* of hospitalization for observation, diagnosis, or treatment of emergency conditions, when in the judgment of University Health Service physicians or private physicians it is thought necessary.

Responsibility for hospital treatment or special hospital expense is not assumed by the University Health Service. The hospitalized student is under the medical or surgical care of the senior members of the hospital staff and may be charged a moderate fee for this service. The hospitalized student has choice of his staff or other physician.

STUDENT AUTOMOBILES

The University does not bar the use of automobiles by students. However, students can be given only very limited parking space on the campus, and the use of autos is discouraged. Unless the student drives a long distance to and

from his home each day or is physically incapacitated, he does not need a car while attending the University. The cooperation of parents in this matter is earnestly desired.

Every student driving a car on the campus must register the car at the beginning of each Quarter at the Information Desk in the Administration Building. Any student who fails to register his car will be given a *double penalty* when cited to the traffic court for violation of the University rule. Registration of the car entitles the student to park *only* in areas set aside for student parking.

FEES AND EXPENSES

Registration is not complete until all fees have been paid. No student will have any privileges in the classes or laboratories until all fees and deposits are paid, except under special procedure authorized by the President.

Graduate students must register and pay their fees not later than the end of the first week of the Quarter. All graduate students who have not paid their fees before 4 P. M. on Monday following the beginning of classes shall be assessed a penalty of $1.00 for each succeeding day or fraction thereof (with a maximum of $10.00) unless excused by the Registrar.

1. Matriculation fee (non-returnable)
   Required of every student on *first admission to the University* $15.00
2. Incidental fees
   Incidental fees do not vary with the number of courses taken
   Quarter fee for a resident of Ohio..... 20.00
   *Quarter fee, including non-resident fee, for a non-resident of Ohio 70.00
3. Special fees
   (a) General Activities fee..... 5.00
   (b) Laboratory Breakage deposits—amounts vary with the course .....from 1.00 to 20.00
   Students are required to pay for all materials consumed in laboratory work. A laboratory deposit for each laboratory course must be made at the time of registration before the student may enter the laboratory. All laboratory supplies are sold to students at the Laboratory Supply Store, Chemistry Building, and charged against the deposits (See page 19). Instructors shall not permit a student to engage in laboratory work unless the student has shown a receipt from the Bursar for the deposit required in the course
   (c) Abstract fee
   The abstracts of Masters' theses and Ph.D. dissertations are published in the form of a journal at the end of each Quarter and a special fee for editing, printing, and binding these abstracts is required for each person receiving such a degree from this University. This fee must be paid not later than a date which is set by the Graduate School office for the deposit of the abstract and thesis
   Abstracts of Masters' theses..... 5.00
   Abstracts of Ph.D. dissertations..... 50.00

NOTE: Checks for fees will be accepted by the University but only when the check is drawn for the exact amount of the fees. When such checks are not paid on presentation at bank, registration will be automatically cancelled and receipts given considered null and void.

(d) Binding fee for theses and dissertations
A special binding fee must be paid to the Bursar of the University not later than a date which is set by the Graduate School office for the deposit of the abstract and thesis 2.50

*NON-RESIDENTS

Every student who is not a legal resident of the State of Ohio is required to pay a non-resident fee of $50.00 each Quarter (or $25.00 each term of the Summer Quarter) of his residence in the University in addition to other University fees. The burden of registering under the proper residence is placed upon the student. If there is any possible question of his right to legal residence the matter should be brought to the attention of the Registrar and passed upon, previous to his registration or payment of fees. Any student who registers improperly under this rule shall be required to pay not only the non-resident fee but shall be assessed a penalty of $10.00. Students who do not pay this fee within thirty days after they have been notified that the non-resident fee has been assessed against them, will have their registration in the University cancelled.

The rules are as follows:

1. No student shall be considered eligible to register in the University as a resident of the State of Ohio unless he has had a *bona fide* domicile in the State twelve consecutive months.

2. No student whose domicile was outside the State of Ohio in the year preceding his original enrollment in the University shall be considered a resident unless it can be clearly established by him, that his former domicile has been abandoned and a new domicile established in the State of Ohio and maintained for at least *twelve consecutive months.* No application for resident standing can be considered until the applicant is 22 years of age.

3. No student whose domicile was outside the State of Ohio at any time after his original enrollment in the University shall be considered a resident unless he has established his domicile as stated in paragraph 2.

4. MINORS. The domicile of a minor student shall be considered the same as that of his natural or legal guardian, if any, regardless of emancipation. If an Ohio resident is appointed guardian of a non-resident minor the latter shall be considered a non-resident until twelve months after such appointment.

5. WIVES. The legal residence of wives shall follow that of husbands.

6. The President will exercise his discretion as to the remission of non-resident fees in the cases of:

a. Children of members of the United States Army, Navy, or Marine Corps, and persons who are orphans or in somewhat similar status.

b. Non-resident minors for whom an Ohio resident has been appointed guardian.

c. Aliens.

ROOM AND BOARD

Room and Board. (See Living Arrangements, page 25.)

RETURN OF FEES ON WITHDRAWAL

Fees are returnable in case a student withdraws on account of sickness or for other causes entirely beyond his control, if such withdrawal is made during the first thirty days of the Quarter. Students withdrawing under request from the University are not entitled to any return of fees. Permission to withdraw, given in writing by the Dean of the College, must be presented to the Bursar within this thirty-day period. Ordinarily no more than one-half of the fees

paid will be refunded; if the case has exceptional circumstances it should be referred to the President for his judgment.

No fees will be returned in case of withdrawal of students until thirty days have elapsed from the date of withdrawal.

If fees are paid under mistake of law or fact they are returnable in full.

Fees are not returnable except as provided in this rule.

On Laboratory Deposits. If a student is forced to withdraw from a laboratory course during a Quarter, he must first secure permission from his Dean.

No portion of a laboratory deposit of $5.00 or less shall be returned, unless the course is officially dropped by the student and request for refund presented within thirty days after the payment of the deposit.

On a laboratory deposit of $6.00 or more the unexpended part of the deposit is returnable if called for on or before the close of the Spring Quarter of the fiscal year in which the deposit has been made.

An order for refund for the unexpended portion of the deposit may be obtained by applying at the Laboratory Supply Store, Chemistry Building. The unexpended part of the deposit will be paid at the Bursar's Office on presentation of the order for refund.

SPECIAL FEE—PENALTY

PENALTY FOR FAILURE TO KEEP APPOINTMENT FOR PHYSICAL EXAMINATION

A fee of $1.00 will be assessed for failure to keep appointment for Physical Examination or for change in date of Physical Examination.

STUDENT PERSONAL EXPENSE FUNDS

The incoming student will save himself much time and trouble by taking a few simple precautions in regard to his personal expense money. The student should bring enough cash to cover all expenses for several days. If he does not wish to carry cash, he should use travellers checks, as they are readily cashed. If he does bring a check, it should be in the form of a bank draft or cashier's check. The student who has a check should not wait until he has spent all his money before cashing the check for it may take several days to collect it. Be sure that any checks that are for the payment of fees are drawn for the exact amount of the fees.

The following facts concerning the cashing of checks should be borne in mind by parents and prospective students.

(a) The Ohio State University does not cash checks.

(b) Checks for fees will be accepted by the University, but only when the check is drawn for the exact amount of the fees.

(c) Banks do not cash checks for strangers unless the check is endorsed by a customer of the bank or some person of known responsibility. This rule applies to cashier's checks, bank drafts, and certified checks.

The student who intends to use a checking account will find that an account in Columbus will be of more value than an account at home or in some other city. An account with a Columbus bank will provide a safe place for depositing funds, will help create a local credit standing, will furnish a means of depositing and cashing checks, and will help the student to understand banking practices.

SCHOLARLY PUBLICATIONS

The Graduate Faculty is engaged both in teaching and research. The results of its scholarly activities ordinarily appear as research papers in appropriate journals or as scholarly monographs. In order to make the results of these investigations more available, the Graduate School publishes a series of

monographs in different fields of learning. A manuscript is accepted for publication on the basis that it contains new and original work. In exceptional cases the results of research work done by graduate students may be accepted for publication as a monograph. These monographs are sold at cost and it is the established policy of the Graduate School to publish only important contributions to knowledge which would ordinarily not be accepted for publication on a commercial basis. The University Library uses these publications as a basis of exchange for publications from other universities. A complete list of those already published or in press can be had on application to the Office of the Graduate School.

ASSISTANTSHIPS, FELLOWSHIPS, AND SCHOLARSHIPS

GRADUATE ASSISTANTSHIPS OPEN TO GRADUATE STUDENTS

In order to encourage graduates of this University and of other similar and approved institutions, especially those in Ohio, to continue their studies and to pursue advanced work leading to the higher degrees, the University has established graduate assistantships in several departments. Graduate assistants must be registered in the Graduate School as candidates for a graduate degree. They are elected for the year—four Quarters. During three Quarters, generally the Autumn, Winter, and Spring Quarters, they must devote approximately one-third of their time to assisting in the work of the department in which they are specializing; during the remaining Quarter the graduate assistants are free to carry on their work at the University or elsewhere. Each graduate assistant must confer with the chairman of the department in which he is specializing concerning the Quarters that he must be in residence. A graduate assistant receives a stipend of $450, payable in nine monthly installments during the three Quarters in which he is rendering service. In addition, all fees are remitted except a matriculation fee of $15.00. If a graduate degree is obtained, the assistant must pay a fee for editing and printing the abstract of his thesis or dissertation and for binding the thesis or dissertation ($7.50 in the case of the Master's degree and $52.50 in the case of the degree of Doctor of Philosophy).

Students desiring to apply for graduate assistantships in any academic year *must present their applications not later than March 1 of the preceding year.* Application blanks may be obtained upon request by addressing the chairman of the department in which the candidate desires to secure such an assistantship.

UNIVERSITY SCHOLARSHIPS AND FELLOWSHIPS

In addition to the graduate assistantships, a limited number of scholarships and fellowships have also been established. The scholarships are open to students having a baccalaureate degree from an approved institution, and have a value of $300 with exemption from all fees, except the matriculation fee of $15.00. The fellowships, on the other hand, are open only to students who have at least the Master's degree or its equivalent, and have a value of $500 with like exemption from all fees, except the matriculation fee. (This exemption from fees amounts to $72.00 for residents of Ohio and $222 for nonresidents of Ohio for the academic year.) If a graduate degree is obtained, a scholar or a fellow must pay a fee for editing and printing the abstract of his thesis or dissertation and for binding the thesis or dissertation ($7.50 in the case of the Master's degree and $52.50 in the case of the degree of Doctor of Philosophy). These awards are limited to applicants under thirty-five years of age.

Scholars and fellows are selected on a basis of merit, irrespective of the departments in which they wish to specialize, and *must devote all their time to graduate work, including research.* They are elected for the year, four Quarters, but are required to be in attendance only three Quarters, generally the Autumn, Winter, and Spring Quarters, during the year. Candidates for these positions for the year 1944-1945 must file their applications not later than February 15, 1944. Application blanks may be obtained by addressing the Dean of the Graduate School. Appointments are made annually on April 1 in accordance with the regulations of the Association of American Universities, of which Association the University is a member.

NON-RESIDENT TUITION SCHOLARSHIPS

Each year the Graduate School offers fifty non-resident tuition scholarships, available to graduate students who are not residents of Ohio. These scholarships provide for the remission of the non-resident tuition fee of $50.00 a Quarter and, therefore, carry a stipend which is equivalent to $150 a year. The regular incidental fees must be paid just as though the student were a resident of Ohio. These scholarships are awarded only to students of outstanding ability. Applications should be accompanied by a transcript of record of undergraduate and graduate work (if any), letters of recommendation from those familiar with the applicant's work and any other available evidences of ability and achievement. Candidates for these non-resident tuition scholarships should apply to the Dean of the Graduate School for application forms and submit them not later than February 15.

THE FREDERICK HILLIS LUMLEY MEMORIAL

Mr. and Mrs. Frederick E. Lumley, in memory of their son, have created the Frederick Hillis Lumley Memorial Fund in experimental and theoretical psychology. From the income of this fund a fellowship or scholarship in experimental or theoretical psychology will be created by the committee in charge of the fund; or at the discretion of this committee, the income from the fund may be spent for publication of work done at The Ohio State University in the fields mentioned above, or for such other aid in furthering important research in the field as the committee may approve.

ENDOWED FELLOWSHIPS

THE ELIZABETH CLAY HOWALD SCHOLARSHIP

This scholarship, endowed by the late Ferdinand Howald, an alumnus of The Ohio State University, in memory of his mother, Elizabeth Clay Howald, carries a stipend of $3,000 payable in twelve monthly installments.

Any person who has shown marked ability in some field of study and has in progress work, the results of which promise to constitute important additions to our knowledge, shall be deemed eligible to appointment to this Scholarship.

The scholar will be expected to devote his time uninterruptedly to the pursuit of his investigations. If he has ever been a student of The Ohio State University or a member of the University staff, he may carry on his investigations either at The Ohio State University or, subject to the approval of the Graduate Council, elsewhere either in this country or abroad where superior advantages for his particular field of study are available. If the scholar has never had any connection with The Ohio State University, however, then he must carry on his investigations at The Ohio State University.

Applications must be filed with the Dean of the Graduate School not later than March 1. The appointment will be made in April and the term of appointment will begin July 1 and extend to July 1.

Prospective candidates may secure application blanks by addressing the Dean of the Graduate School.

THE MARY S. MUELLHAUPT SCHOLARSHIPS

These scholarships, which were endowed by the late Mrs. Mary S. Muellhaupt of Portland, Oregon, are granted annually to the candidates who are considered most likely to promote, by original research, one of the biological sciences, particularly botany, bacteriology, physiology and zoology. They carry stipends of $1,400 to $1,600 each.

Anyone who has recently completed the requirements for the Ph.D. degree or who has training equivalent to this degree, as shown by publications, shall be eligible for appointment to these scholarships.

The holders of these scholarships must devote their entire time to research for a period of one calendar year from the date of appointment with one month for vacation.

Applications should be accompanied by publications and other supporting evidence of research experience, as well as a plan of the research proposed under the scholarship. They must be filed with the Dean of the Graduate School not later than March 1.

Prospective candidates may secure application blanks by addressing the Dean of the Graduate School.

THE STILLMAN W. ROBINSON FELLOWSHIP

The fellowship endowed by Stillman W. Robinson, late Professor of Mechanical Engineering, for the encouragement of graduate research in engineering, has an annual value of $750, and is open to graduates in Mechanical, Civil, and Electrical Engineering.

The holder of the fellowship must devote his entire time to graduate work. This should lead to the Master's or the Doctor's degree under the general regulations which obtain in reference to these degrees. For further information, or for application blanks, address the Dean of the Graduate School or the Secretary of the College of Engineering.

All applications should be filed with the Dean of the Graduate School not later than February 15.

THE NATHANIEL WRIGHT LORD FELLOWSHIP

The fellowship endowed by William Bartlett Calkins, an alumnus of the University, in memory of Nathaniel Wright Lord, late Professor of Metallurgy, has an annual value of $750. This fellowship was established to encourage graduate research on solid fuels or products derived from solid fuels which have a practical application in the industrial world.

The holder of the fellowship must devote his entire time to graduate work. This should lead to the degree of Master of Science or Doctor of Philosophy, under the general regulations which obtain in reference to these degrees. For further information or for application blanks address the Dean of the Graduate School.

All applications should be filed with the Dean of the Graduate School not later than February 15.

EDWARD ORTON JUNIOR CERAMIC FOUNDATION FELLOWSHIP

Under the provisions of the will of the late Edward Orton, Jr., the Edward Orton Junior Ceramic Foundation has established a fellowship having an annual value of $750. Of this amount $600 is the stipend of the Fellow and $150 is used for the purchase of apparatus and materials. The holders of these fellowships are expected to devote their entire time to graduate courses and research work in the field of ceramics under the general direction of the Department of Ceramic Engineering and ordinarily will be candidates for either the Master of Science or the Doctor of Philosophy degree.

THE JOHN A. BOWNOCKER FELLOWSHIP AND SCHOLARSHIPS

A fellowship and one or more scholarships may be provided from funds bequeathed by John A. Bownocker, an alumnus of the University and late Professor of Geology. The fellowship has an annual value of $750 and a scholarship has an annual value of $450. Both Bownocker Fellowships and Scholarships carry the same exemption from fees as do the University Fellowships and Scholarships. (See page 20.) Applicants must have had at least one year of graduate work.

The holder of a John A. Bownocker Fellowship or Scholarship must register in the Graduate School of The Ohio State University and must devote his entire time to graduate work and research in the field of geology. This should lead towards the degree of Doctor of Philosophy under the general regulations which obtain in reference to this degree. For further information, or for application blanks, address the Dean of the Graduate School.

All applications must be filed with the Dean of the Graduate School not later than March 1. Appointments will be made April 1.

SPECIAL FELLOWSHIPS AND SCHOLARSHIPS

THE BATTELLE MEMORIAL INSTITUTE FELLOWSHIPS

The Battelle Memorial Institute of Columbus has established one or more fellowships at The Ohio State University. Each fellowship carries an honorarium of $60.00 a month for ten months, September to June inclusive. All course work selected by the fellow will be taken at The Ohio State University, while the research work will be carried on at The Battelle Memorial Institute. Inasmuch as this institute was founded for the purpose of studying the application of science to industries, especially in Metallurgy, Fuels and allied fields, the candidate's research work must be in this general field. Ordinarily each fellow will be a candidate either for the degree of Master of Science or Doctor of Philosophy, and will devote his entire time to graduate work, including research.

Candidates may secure application blanks by addressing the Dean of the Graduate School. All applications should be received not later than March 1 of each academic year.

THE MARGARET G. HARDER PAN-AMERICAN SCHOLARSHIP

In May, 1930, the Ohio Federation of Women's Clubs established a scholarship to be known as the Margaret G. Harder Pan-American Scholarship. This scholarship carries an honorarium of $800 payable in monthly installments, and in addition the holder of the scholarship is allowed the same exemption of fees as are the University Scholars and Fellows.

The scholarship is open to women graduates of reputable South American Colleges and Universities. For further information concerning this scholarship address Mrs. William N. Harder, 434 East Church Street, Marion, Ohio.

THE J. T. BAKER CHEMICAL COMPANY FELLOWSHIP

This Fellowship is devoted to fundamental research in Inorganic Analytical Chemistry. It is limited to institutions which grant the doctor's degree in chemistry in the states of Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin, and is awarded annually to some institution which has been conducting research in Inorganic Analytical Chemistry. The stipend of the Fellow is $1,000. The holder of this Fellowship is not exempt from fees. Candidates may secure application blanks by addressing the Dean of the Graduate School. Applications should be filed not later than March 1.

THE PROCTER AND GAMBLE FELLOWSHIP

This Fellowship, established by the Procter and Gamble Company, has an annual value of $950. This fellowship was established to encourage graduate

work in the field of Chemical Engineering and is open to graduate students in the Department of Chemical Engineering. The holder of this Fellowship must devote his entire time to graduate work leading to the degree of Doctor of Philosophy. The holder of this Fellowship is allowed the same exemption from fees as are the University Fellows and Scholars. Candidates may secure application blanks by addressing the Dean of the Graduate School. Applications should be filed not later than March 1.

PURE HYDROCARBON RESEARCH FELLOWSHIPS

These Fellowships are made possible by a program of research on pure hydrocarbons supported by interested companies in the automotive and petroleum industries and sponsored by the American Petroleum Institute through the Industrial Research Foundation. They are limited to graduate students who have completed one year of graduate work and have passed their divisional examinations for the Ph.D. degree. The fellow will be required to devote one-half of his time to the work of the Pure Hydrocarbon Research Program and his own research interest should be in the same or a closely allied field. The stipend is $550 for second year graduate students, and the appointment for a period of eleven months. Fellows are eligible for reappointment at $660 a year, subject to satisfactory service. Applications should be filed not later than June 1.

THE JANSKY AND BAILEY FELLOWSHIP

The firm of Jansky and Bailey of Washington, D. C., has established a Fellowship in the Department of Electrical Engineering to encourage fundamental research in Radio Communication. The annual value is $300. The holder of this Fellowship is allowed the same exemption from fees as are the University Fellows and Scholars. Candidates may secure application blanks by addressing the Dean of the Graduate School. Applications should be filed not later than March 1.

POST-DOCTORATE FELLOWSHIPS

E. I. du PONT de NEMOURS AND COMPANY POST-DOCTORATE FELLOWSHIP

The E. I. du Pont de Nemours and Company of Wilmington, Delaware, has established for the year 1941-1942 a post-doctorate fellowship for research in the field of cellulose chemistry. All applicants must hold the degree of Doctor of Philosophy. The stipend is $2,000 for the year. Appilcations must be filed with the Chairman of the Department of Chemistry.

SPECIAL PRIVILEGES TO DOCTORS OF PHILOSOPHY AND OF SCIENCE

The privilege of attending lectures and seminars and of carrying on research in the laboratories and libraries is extended by the President of the University, on the recommendation of the chairman of a department to doctors of philosophy or doctors of science or to scholars with an established reputation. Such visiting scholars may not take courses for credit but are expected to devote their time to some form of scholarly work. There will be no charge except for laboratory supplies. Those desiring to avail themselves of this privilege should correspond with the chairman of the department in which they are interested and with the President before the opening of the Quarter in which they desire to be in residence at the University.

OTHER FELLOWSHIPS

A number of fellowships are established each year by various organizations and societies for one year only, for the purpose of carrying on research work in definite fields of investigation. Some idea may be gained concerning these fellowships from the following which were among those awarded during the year 1942-1943:

1 Abbott Laboratories Fellowship in Chemistry
1 Allied Chemical and Dye Corporation Fellowship in Chemistry
1 Alberta Garber Scott Fellowship in Sociology
2 Julius Rosenwald Fund Felowships in Chemical Engineering and Education, respectively
1 Roses, Incorporated, Fellowship in Horticulture
1 Westminster Foundation Scholarship in Speech
1 Battelle Memorial Institute Fellowship in Chemical Engineering
1 James F. Hagerty Scholarship in Social Administration
1 Anna Fuller Fund Fellowship in Chemistry

WOMEN GRADUATE RESIDENTS

Three women students will receive stipends of $60.00 a month for nine months of the year and room and board as Graduate Residents in Canfield Hall. In return they give forty-four hours a week to duties under the direction of the Head Resident. They pay their own tuition and other fees. They cannot take any additional paid work. More detailed information will be furnished on request.

One Graduate Resident in the W.S.G.A. Cooperative Club has the opportunity to materially reduce her room and board expenses by taking part in this cooperatively-operated residence for upper division students.

Upon application from any sorority, the Board of Trustees will grant free tuition to Graduate Residents for whom the sorority offers a fellowship covering room and board. In return the Graduate Resident cooperates with the Dean of Women in helping the members of the sorority as an older adviser.

Applications for all of the above three kinds of positions should be made before April 1.

LIVING ARRANGEMENTS

The President of the University has the authority to supervise living arrangements of students not residents of the city of Columbus and to order the immediate withdrawal of any student from any boarding or lodging house in which the surroundings are undesirable.

ROOMS AND BOARD FOR MEN

Furnished rooms can be obtained at prices varying from $10.00 to $15.00 a month (single) and $16.00 to $30.00 (double). The cost of the table board in the clubs and restaurants near the University is from $5.00 to $7.00 a week. Board can be secured at the Ohio Union, as well as at Pomerene Hall, at reasonable prices.

Board with furnished rooms can be obtained in private families within convenient distance from the University at rates varying around $9.00 a week.

MEN'S DORMITORIES

Baker Hall, a new residence hall for men students was opened in September, 1940. Rates for room and board are from $112.00 to $132.00 a Quarter, according to the type of room selected. Rooms are furnished in a comfortable and convenient manner. Adequate social and recreational privileges are available.

Students interested in residence should write to the Superintendent of Baker Hall, Ohio State University, for a special bulletin describing the hall and an application form. Assignments will be made in the order of application.

The University possesses three low-cost dormitories for men, the Tower Club, the Stadium Club, and the Buckeye Club. The Clubs were organized

for men who are in great need of financial assistance and no others should apply for admission. Applicants with unusually good records in the high school are eligible for consideration. Legal residents of Ohio only can be considered. The Clubs are run on a cooperative dormitory plan with very simple accommodations. Board and room costs are approximately $45.00 a Quarter. Applications should be sent to the University Examiner.

THE GEORGE WELLS KNIGHT INTERNATIONAL HOUSE

The George Wells Knight International House, 104 Fifteenth Avenue, under the supervision of a board of trustees made up of Columbus men, offers desirable living quarters to foreign and a limited number of American students. Rates for rooms are from $33.00 to $39.00 a Quarter, according to the kind of room selected.

MEN'S FRATERNITIES

A large number of men enjoy the advantages of living together in fraternity homes. These Greek letter organizations have for many years maintained establishments which provide excellent rooming and boarding arrangements. They meet the same standards of inspection that are required of the approved houses and are approved as an integral part of the University's housing arrangements. Prospective students who are interested in possible membership should write to Mr. Arthur M. Wellington, Assistant Dean of Men. The cost of living in a fraternity is about the same as in Baker Hall.

MEN'S HOUSING BUREAU

Many men students reside in private rooming houses in the University district. In order to assist the students (especially those entering for the first time) in finding desirable rooms at the greatest saving, the University has created the Men's Housing Bureau, located in the office of the Dean of Men, first floor, Administration Building.

A number of cooperative houses have been established in the University district where men students can get room and board for approximately $85.00 a Quarter. In these houses the students are permitted the use of the entire house with all of the conveniences. The men are expected to assist in the work of the house. Applications should be sent to the Men's Housing Bureau.

Classified lists of rooms available for every student and for any number of students are always available at this office. Boarding houses are likewise listed.

If the student signs a "Rooming House Agreement" he shall be expected to be responsible for the rental price of the room as specified in the agreement, unless he can present satisfactory reasons to the Men's Housing Bureau for moving out before the expiration of that period, or, unless he can secure a satisfactory substitute. If he moves out before the expiration of the Quarter without presenting a satisfactory excuse he shall forfeit one month's rent. The signing of such agreement is optional.

The University warns students not to rent rooms that have not been placed on the approved list by the Men's Housing Bureau. Any one renting a room which is not on the approved list does so at his own risk.

WOMEN STUDENTS

The Ohio State University is open to women upon the same conditions and by the same methods of registration offered to men. Every woman student, whether undergraduate or graduate, must register with the Dean of Women at her office in Pomerene Hall during the first week of each Quarter. The exact dates of registration will be announced each Quarter.

LIVING ARRANGEMENTS FOR WOMEN

All living arrangements for women are under the supervision of the Dean of Women. Applications for residence in the residence halls and private room-

ing houses should be made directly to the Dean of Women. A limited number of graduate women can be accommodated in these types of residence.

After September 10, 1943, housing cannot be arranged by correspondence. Students or their parents must consult with the Dean of Women in person in Columbus for housing accommodations.

OTHER ARRANGEMENTS

A limited list of rooms in private homes is available for graduate women at the Office of the Dean of Women. There are also a very few light housekeeping rooms and apartments reported to the Dean of Women and available for the inspection of graduate women. Graduate women are not permitted to live in any house where there are men roomers.

FOR FURTHER DETAILED INFORMATION

Booklets and other sources of information about the various kinds of living quarters will be gladly and promptly sent to any one who inquires. Such information will include detailed descriptions of the halls of residence and houses as well as prices for the various types of accommodation. Address requests for booklets to The Dean of Women, Pomerene Hall, The Ohio State University, Columbus, Ohio.

ADMISSION

METHOD OF ADMISSION

The admission of students is in charge of the University Entrance Board, which determines the credits that shall be issued on all entrance examinations and certificates, and furnishes all desired information to applicants. Correspondence relating to admission should be addressed to the University Examiner, The Ohio State University, Columbus.

REQUIREMENTS FOR ADMISSION

Admission to the Graduate School is open to all graduates of The Ohio State University as well as to the graduates of all other colleges and universities of approved standing, *provided their undergraduate records are satisfactory.* Before entering upon graduate work in any department, the applicant must present evidence to the effect that he has had the necessary prerequisite training that will enable him to pursue with profit the courses desired. *It must be remembered also that admission to the Graduate School does not imply admission to candidacy for the degree.* No graduate student, not even one who is a graduate of The Ohio State University, is admitted to candidacy for a degree until he has been in residence a sufficient time to enable his instructors to judge of his ability to carry on graduate work.

Information concerning admission to candidacy will be found under the headings "Requirements for the Degrees of Master of Arts and Master of Science" and "Requirements for the Degree of Doctor of Philosophy."

A graduate of a college not on the approved list may be admitted to the Graduate School, provided that his college course, when checked by the University Examiner, entitles him to a credit of not less than one hundred and thirty-five Quarter-credit hours, or ninety semester hours. In all such cases, however, the residence and hour requirements for the graduate degree will be correspondingly increased.

Students who find it necessary to make up deficiences of any kind by taking non-credit courses may not register, in any Quarter, for more Quarter hours in non-credit courses than in courses for which they expect to receive graduate credit.

Graduate students are classified in two groups as follows:

Regular Graduate Students. Students in this group are those who wish to work toward a graduate degree at The Ohio State University. A program of study will be outlined for a regular graduate student at the time of his first registration in the Graduate School. After consultation with an adviser or a departmental committee on graduate study, the status of regular graduate students will be determined as completely as possible and conditions for candidacy for the appropriate degree will be specified.

Special Graduate Students. Students in this group are those who do not expect to work toward an advanced degree but wish to elect work with a special purpose in view. Such students must comply with all the regular requirements for admission to the Graduate School. Their courses of study may be arranged with maximum freedom. Any course announced for advanced undergraduate students and for graduate students is open for election by a Special Student under the same conditions as those imposed upon students who are candidates for degrees.

Should a Special Student subsequently desire to become a candidate for a degree, the amount of credit he is to receive for work already completed will be determined by the department in which he expects to specialize and he must satisfy all the departmental requirements necessary for admission for the degree he seeks.

METHOD OF PROCEDURE FOR ADMISSION

An applicant for admission to the Graduate School must first secure a statement from the registrar or other officer of the university or college of which he is a graduate, which contains the following information: (1) the date of graduation of the applicant; (2) the degree received; (3) a complete list of courses taken and grades received. This transcript, together with a catalogue of the institution of which the applicant is a graduate, should be sent to the University Entrance Board not later than three weeks (an earlier date is preferable) before the opening of the Quarter in which the applicant expects to register. If the credentials are satisfactory, an admission card to the Graduate School will be mailed promptly to the applicant. If the credentials are not satisfactory or if further information is desired, the applicant will be notified at once by correspondence.

In case the applicant finds it impossible to send by mail the statement referred to in the preceding paragraph, he may present it in person when he reports for registration and receive his admission card. However, the office of the Entrance Board is always crowded on the opening days of the Quarters, so that the applicant will find it greatly to his advantage to secure his admission card in advance by correspondence.

METHOD OF PROCEDURE FOR REGISTRATION

The method of procedure for registration is as follows: The student, having secured from the University Entrance Board his admission card to the Graduate School, will present this card at the Office of the Graduate School in Room 309, Administration Building. Here he will be given a course of study card and will be instructed as to the further method of procedure for registration. This procedure will include the appointment of an adviser who will assist the student in mapping out, and entering upon the course of study card, a suitable course of study. The adviser will signify his approval of the course of study by signing the card in the appropriate place. The courses having been entered upon the course of study card, the student will then return the card to the office of the Graduate School and will have his schedule card properly filled out and approved. The student will then immediately report to the Registrar's office in the Administration Building and obtain his fee card. He will then pay his fees at the office of the Bursar in the Administration Building. *Registra-*

tion is not complete until the fees have been paid. Even a student who for any reason is exempt from the payment of fees, must report to the Bursar's office and have his fee card stamped. All fees and laboratory deposits required by a student must be paid to the Bursar before the student is entitled to enter his classes.

No student is permitted to change his adviser without the approval of the Dean of the Graduate School.

CHANGES IN COURSE

After a student's election card has been made out, changes in his course of study will be made only upon the written request of the student's adviser. No credit will be given on the University records for courses taken without the proper authorization.

DATE OF REGISTRATION

Registration for any Quarter is permissible at any time during the three-weeks period previous to the opening day of the Quarter. If it is at all possible a student should register sometime during this period. However, students from out of town should write for an appointment before coming to register *during the vacation periods between Quarters* since it is not possible to register without the approval of the department in which the student is specializing. Students who find it impossible to register before the opening day of the Quarter will be allowed to register during the first week of the Quarter *only*.

A student who is exempt from the payment of fees under the regulations of the Board of Trustees must complete his registration promptly in order to obtain such exemption.

AUDITING COURSES

Regularly registered students may audit courses with the written permission of the instructor in charge of the course or courses. Such courses must be officially entered upon the schedule of the student. Cards for this purpose may be obtained from the office of the Graduate School during the first two weeks of the Quarter only.

WITHDRAWAL FROM COURSES

After registration is completed, the student must report at the office of the Graduate School in order to withdraw officially from any course; otherwise he will be marked "Failed" in the course from which he withdraws. After the middle of the Quarter, the instructor's written permission is necessary before withdrawal from a course will be permitted. Withdrawal from courses will not be permitted after two weeks prior to the beginning of final examinations.

STUDENTS TRANSFERRING TO A COLLEGE IN THE UNIVERSITY

A student who desires to transfer from the Graduate School to a college of this University must make his application for such transfer to the University Examiner. This transfer must be approved by the University Examiner before the student will be permitted to proceed with his registration in the college which he is proposing to enter.

WITHDRAWAL FROM THE UNIVERSITY

A student who desires to withdraw from the University must apply to the Dean of the Graduate School for permission to withdraw in good standing. *If the student leaves the University at any time during the Quarter, without communicating with the Dean, he will be marked as having failed in all of his courses for the Quarter.* If a personal interview is impossible, the Dean must be notified by mail. In order to retain his right to voluntary return, the reasons given for withdrawal must be satisfactory to the Dean, and must be so endorsed at the time the application is filed. After the middle of the Quarter the student must obtain written permission from the instructors in charge of his

courses before he may withdraw. No withdrawal from the University will be permitted after two weeks prior to the beginning of final examinations.

The written permission of the Dean shall be filed with the Registrar at once by the student in order that the proper entry may be made upon the University records.

COMBINATION ARTS AND SCIENCES-GRADUATE COURSE LEADING TO THE TWO DEGREES, BACHELOR OF ARTS AND MASTER OF ARTS

In accordance with an agreement made between the College of Arts and Sciences and the Graduate School, it is possible for students of exceptional ability to secure both the Bachelor of Arts and Master of Arts degrees by an extra Quarter of study in addition to the regular four-year period ordinarily required for the degree of Bachelor of Arts. Indeed, by the proper planning of the sophomore and junior schedule of study, it is even possible to secure both of these degrees in four years.

Admission to the Combination Arts and Sciences-Graduate course is limited to those students in the College of Arts and Sciences who have completed all junior division requirements and at least one hundred and forty-five Quarter hours of work with a point ratio of not less than 3.5.

Students who are eligible and wish to apply for admission to this combination course must do so as soon as they have finished the junior requirements. Such students should report to the office of the College of Arts and Sciences or to the Graduate School for detailed information as to method of procedure.

CREDIT TOWARDS A MASTER'S DEGREE FOR COURSES REQUIRED FOR THE PROFESSIONAL DEGREES IN THE COLLEGE OF DENTISTRY, THE COLLEGE OF LAW, AND THE COLLEGE OF MEDICINE

Students admitted by the University Examiner to both the Graduate School and either the College of Dentistry, the College of Law, or the College of Medicine may offer not to exced 15 Quarter hours of work required for either the D.D.S., LL.B., or M.D. degree towards the Master's degree, or 45 Quarter hours towards the Ph.D. degree, this number to include the 15 Quarter hours already allowed for the Master's degree. No student who has an average of less than "B" in courses taken in the field of specialization is eligible to double registration. To register in this double curriculum the candidate must first secure an admission card from the University Examiner. This admission card must be presented at the office of the Graduate School where a course card will be made out for him. He must then present the same to an adviser who will be appointed in the department in which he wishes to major for the graduate degree. The adviser, after consultation with the candidate, will map out the course proposed for the Master's or the Ph.D. degree, which may include the number of Quarter hours of Medical, Law, or Dental work referred to above, and sign the card, thus indicating his approval of the course. The candidate will then return the card to the office of the Graduate School. If the course so selected meets with the approval of the Dean of the Graduate School, the candidate will be registered in the Graduate School as well as in the appropriate professional college. In order to secure such double credit the candidate must be registered in the Graduate School during the Quarter in which the work is taken and must receive a grade of "B" or better in the courses required for the Law, Medical, or Dental degree.

DEGREES CONFERRED

The following higher degrees are conferred by the University: Master of Arts, Master of Science, Master of Business Administration, Master of Arts

in Social Administration, Master of Science in Public Administration, Master of Science in Pharmacy, Master of Dental Science, Master of Medical Science, Doctor of Philosophy. The requirements for the Master's degree will be found on page 33 to 40 and for the degree of Doctor of Philosophy on pages 41 to 43. All candidates must read these requirements carefully.

REGISTRATION DURING THE QUARTER IN WHICH THE DEGREE IS SOUGHT

A candidate for any graduate degree must be registered in the Graduate School during the Quarter in which he expects to come up for the degree.

GRADING SYSTEM FOR GRADUATE STUDENTS

The work of all graduate students performed in connection with the development of theses and dissertations is reported simply as "Prog" indicating progress until the work is completed when a grade of "Satisfactory" will be reported. All other work is reported as "A" Excellent, "B" Good, "C" Average, "D" Poor, "E" Failed, "E abs." Failed Absent. A graduate student doing acceptable work must attain the mark "A" or "B" in not less than two-thirds of the work included in the course of study outlined for his graduate degree, and not lower than "C" in the remaining one-third.

Any student whose record is deficient under this plan cannot continue as a candidate for an advanced degree except by special action of the Executive Committee of the Graduate Council, on request of the adviser in charge of the candidate's work.

Occasionally, for various reasons, a graduate student may receive a grade of "Incomplete" in a course with the privilege of finishing the work later on. In all such cases, however, this "Incomplete" must be made up not later than the end of the first Quarter of registration after the close of the Quarter in which the "Incomplete" was received, or no credit will be allowed for the course.

A student who receives one or more "Incomplete" grades during a Quarter must reduce his schedule for the following Quarter by the number of hours "Incomplete" received.

All graduate students registered in "600" courses are required to complete a certain amount of work in addition to that required of undergraduates. This may consist of reading additional books on the subject and presenting a review of same, the presentation of reports, or of such other work as the instructor in charge of the course may deem wise.

TOTAL CREDIT THAT MAY BE RECEIVED IN ANY ONE QUARTER

A graduate degree stands for concentration in a limited field of study *No graduate student may receive credit toward a graduate degree for more than fifteen hours in any one Quarter or more than eight hours of graduate credit for work taken during a term of one Summer Quarter.*

CREDIT HOURS FOR PART-TIME ASSISTANTS AND INSTRUCTORS

The maximum credit toward a graduate degree that may be obtained in any one Quarter (a) by a graduate assistant is twelve hours, (b) by an assistant, ten hours, and (c) by an instructor, eight hours. The maximum credit that may be obtained by students holding positions other than those named above will be decided in each case by the Dean of the Graduate School.

SENIORS TAKING COURSES FOR GRADUATE CREDIT

A senior whose full time is not required for the completion of the work for his baccalaureate degree may select certain courses for graduate credit, *but to do this permission must be obtained at the office of the Graduate School (Room 309, Administration Building) before registering for the courses.* A grade of

"B" or better must be received in order to obtain graduate credit. Not more than fifteen Quarter hours of such work may be counted towards an advanced degree.

GRADUATE WORK IN THE SUMMER QUARTER

Candidates for the Master's degree may complete the residence requirement for such a degree by pursuing graduate work at the University for three full Quarters. For the benefit of those who cannot always stay during the entire Summer Quarter, this Quarter is divided into two equal terms. At least one continuous Quarter of residence must be included in the residence requirement of one year for this degree. The remaining work for the degree may be taken in four Summer Terms or by registration during Summer Terms and the completion of a certain amount of satisfactory *ad interim* work under the direction of one or more members of the instructional staff of the department in which the student is specializing. *Ad interim* work must be taken between Summer Terms or Quarters and no student may receive the Master's degree during a Quarter in which he is registered for *ad interim* work. The amount of such work that will be credited towards any advanced degree is limited to fifteen Quarter-hours and the amount during any one *ad interim* period to eight Quarter-hours.

No student is allowed to pursue *ad interim* work unless he has been in residence in the Graduate School of this University at least one term of a Quarter. Moreover, it is optional with any member of the instructional force as to whether or not he will conduct such work.

A student who wishes to pursue *ad interim* work will proceed as follows: Before the close of the Summer term in which he is in residence he will obtain from the office of the Graduate School an appropriate card and, after consultation with the professor in charge of the proposed *ad interim* work, will enter upon this card a brief outline of the work to be pursued in the *ad interim* period. After securing the signature of the professor thus signifying his willingness to conduct the proposed *ad interim* work, the student must deposit this card in the office of the Graduate School *before* the close of the Summer Quarter. As an evidence of earnest intentions, he must also register in the University (this does not imply attendance) for at least one Quarter of each period during which the *ad interim* work is being pursued. He is also required to report to the professor conducting his work at least once a month and to pass such examinations as may be prescribed. He may borrow from the University Library such books as may be necessary for the successful conduct of the work, but will be required to pay for the cost of shipment. Requests for such books should be sent to the Dean of the Graduate School.

OFF-CAMPUS RESEARCH WORK

A student employed outside Columbus who desires to carry on off-campus research work in connection with his thesis or dissertation must have his program approved in advance by the appropriate department and by the Dean of the Graduate School, must maintain his registration in the Graduate School during this entire period, and must pay the regular residence fees. No student may carry off-campus research work unless he has been in residence in the Graduate School of this University for at least one Quarter. Not more than two Quarters of off-campus research may be applied towards a Master's degree and not more than six Quarters towards a Ph.D. degree. Two Quarters of off-campus research are equivalent to one full Quarter of residence work.

INTERDEPARTMENTAL DEGREE PROGRAMS

The Graduate School recognizes the desirability of programs of study and research which lie on the borderland between two or more recognized fields of learning in such a way that they cannot be easily assigned to any one of them. A doctoral candidate who is interested in such a program should consult

with those members of the staff who are most competent to advise him with respect to his special interests. After he has formulated a program of courses and readings which are pertinent to his major interest he should present his proposal to the Dean of the Graduate School. If the student's plan of specialization seems warranted and if he seems competent to utilize materials from two or more recognized fields of learning, the Dean of the Graduate School will appoint a committee from the staffs of the departments which will be most intimately concerned with his work and a representative of the Graduate School. This committee will analyze the student's program, study its feasibility and determine that all basic requirements essential for sound scholarship and the preparation of a satisfactory dissertation have been met. The dissertation must have the unanimous approval of the advisory committee. The plan of study and research as approved by this committee will then be forwarded by the Dean of the Graduate School to the Chairman of each department or to the graduate committee of each department which forms an important part of this borderline field of specialization. If these chairmen or the departmental graduate committees approve this plan of study and research, the Dean of the Graduate School will appoint a doctoral committee consisting of an adviser from each department concerned and a representative of the Graduate School to direct the student's program and to supervise the preparation of his dissertation. The department from which the degree is granted will be determined by the doctoral committee subject to the approval of the department concerned.

THE FRANZ THEODORE STONE LABORATORY

The Franz Theodore Stone Laboratory on Gibraltar Island, Put-in-Bay, Ohio, affords exceptional opportunities to graduate students who wish to carry on research work in botany, entomology, and zoology. The Laboratory will be open during the entire year and students may register for work during any or all of the Quarters. The general rules that apply to graduate work carried on at the University apply equally to the graduate work taken at the Laboratory. The work of instruction is carried on by members of the University Faculty and by members of the faculties of other colleges and universities. Students interested in this work should send to the University Examiner for the Franz Theodore Stone Laboratory Bulletin.

REQUIREMENTS FOR THE DEGREES OF MASTER OF ARTS AND MASTER OF SCIENCE

The degree of Master of Arts will usually be conferred upon candidates whose work lies in the departments properly included in the College of Arts and Sciences, the College of Education, or the College of Commerce and Administration, while the degree of Master of Science will usually be conferred upon candidates whose work lies in the College of Agriculture, the College of Engineering, the College of Medicine, or the College of Veterinary Medicine.

Residence Requirement. A residence of three Quarters or its equivalent wholly devoted to graduate work is required. However, a student may reduce this residence requirement by completing in a satisfactory way fifteen Quarter-credit hours of *ad interim* work as outlined on page 32. A graduate of The Ohio State University may do not to exceed one-half of the required work at another institution having equivalent opportunities for study. The candidate is, however, subject to final examination by The Ohio State University on all work offered for the degree.

A student holding a graduate assistantship must spend at least six weeks in addition to the three Quarters, in order to fulfill the residence requirement. For a part-time assistant, a minimum residence of four Quarters is required, during one of which he must devote full time to his graduate work.

Students entering from other accepted graduate schools will be credited with work already completed, provided authorized statements are presented to the effect that such students have credit in the graduate school for the work specified. *However, no student will be given a degree by The Ohio State University unless he has satisfactorily completed forty-five Quarter-hours of work under the guidance of this University.*

A candidate for the Master's degree must be registered in the Graduate School during the Quarter in which he expects to receive the degree.

Course of Study. The course of study shall be selected in consultation with the student's adviser (see page 28). It must show a reasonable degree of concentration on interrelated subjects and must be pursued under at least two professors. The course of study outlined shall be subject to the approval of the Dean of the Graduate School.

While qualification for the Master's degree is not based entirely upon the completion of a definite number of hours of work, nevertheless, the amount of work required must aggregate not less than the equivalent of fifteen hours of classroom work throughout three Quarters, inclusive of the thesis. This presupposes that the student has completed the necessary prerequisites for graduate work in his chosen field and has been admitted to the Graduate School without condition.

Standard of Work Required. A graduate student doing acceptable work for the Master's degree must attain the mark "A" or "B" in not less than two-thirds of the work included in the course of study outlined for his degree, and the mark of "C" or higher in the remaining one-third.

As soon as a student's record falls below the above requirements, he will automatically be made "Special" and will not be reinstated as a candidate for the Master's degree except by permission of the Executive Committee of the Graduate Council. A student who has been made "Special" because of poor grades will not be permitted to register for thesis or dissertation work nor will he be permitted to take the foreign language examinations for the Master's degree or the Doctor of Philosophy degree.

Admission to Candidacy. A student desiring to be admitted to candidacy for a Master's degree must file his application for admission to candidacy for the degree with the Dean of the Graduate School at a date not later than two weeks after the opening of the Quarter in which the degree is sought.

If permission is granted for the late filing of this petition, a penalty of $5.00 will be assessed the candidate.

Application is made upon a special blank secured from the office of the Graduate School. The applications are passed upon by the Executive Committee of the Graduate Council. Admission to candidacy is based upon undergraduate training and ability to pursue graduate work as revealed by the official reports upon the student's course. No student will be admitted to candidacy until he has completed at least the equivalent of two Quarters' work.

Examination. A student working for a Master's degree is required to pass the regular final examinations in all courses for which he is registered and must receive grades in accordance with the regulations of the Graduate School. A final comprehensive examination also is required to test the candidate's knowledge of the study which he has mainly pursued. This examination is held after the submission and approval of the thesis; it is conducted by a committee composed of the candidate's adviser (chairman) and at least one other member of the instructional force chosen by him. The final examination may be either written, oral, or both at the option of the examining committee. The chairman of the committee is responsible for arranging the examination and for certifying its results to the Dean of the Graduate School. The report of this committee must be unanimous in order to be considered satisfac-

tory. However, when the examining committee consists of three or more members of the instructional staff, in case of a *single* dissenting vote, the case is automatically referred to the Executive Committee with power to act.

A candidate who fails in his final examination must register in the Graduate School and carry on work for an additional Quarter before an opportunity will be given for a second examination, unless special permission is granted by the Graduate Council for an earlier examination at the request of the department concerned. No student will be permitted a third examination.

Thesis. A satisfactory thesis is required. The subject of the thesis, together with the written approval of the professor directing the work, must be filed in the office of the Graduate School at a date not later than that on which the student applies for admission to candidacy.

A candidate who expects to receive his degree at the end of a given Quarter must submit the completed manuscript of his thesis ready for typewriting to his adviser not later than three weeks prior to Commencement Day. If the manuscript is approved the candidate must at once prepare two typewritten copies of the same, following specifications which may be obtained at the office of the Graduate School. If the thesis is then approved the candidate shall deposit it in duplicate in the office of the Graduate school *not later than a date which will be set by the Graduate School for each Quarter* and must pay, at the same time, to the Bursar a fee ($2.50) covering the cost of binding the same.

In case the thesis has already been published, the candidate, instead of following the above procedure, may present two printed unbound copies to his adviser, not later than three weeks prior to Commencement Day. The form of printing as well as the contents must be approved by his adviser. If the thesis is so approved the student must deposit these copies in the office of the Graduate School *not later than a date which will be set by the Graduate School for each Quarter* and must pay to the Bursar a fee ($2.50) covering the cost of binding the same.

The thesis requirement may be waived by the Dean of the Graduate School upon the written recommendation of the candidate's adviser. In all cases where the requirement is waived, action must be taken prior to the date for the filing of the thesis subject.

Abstract of Thesis. In addition to the two approved copies of the thesis which must be deposited in the office of the Graduate School, each candidate must deposit in the office of the Graduate School one *approved* typewritten copy of an abstract of the thesis of approximately three hundred words in length. At the close of each Quarter the Graduate Council proceeds immediately to print the abstracts of all the theses submitted during the Quarter, and to bind these together, in sufficient numbers to meet the exchange list of the University Library. Each candidate must deposit with the Bursar of the University not later than *a date which will be set by the Graduate School for each Quarter* the sum of $5.00 *in cash*. This sum will be used by the Graduate Council to defray expenses connected with the editing, printing, and binding of the abstracts of theses.

Time Limit on Work for Master's Degree. The entire work for the Master's degree must be completed within a period of six years. In the case of students who take *all* the work for the Master's degree during Summer Quarters, the above rule will be interpreted to include the seventh Summer Quarter.

MASTER OF ARTS DEGREE WITH A FIELD OF SPECIALIZATION IN TEACHING OF THE SOCIAL SCIENCES

The following program of work has been arranged for teachers of the social studies in secondary schools and leads to the degree Master of Arts in the interdepartmental field of social sciences. Supervision of graduate work in this

area will be by an interdepartmental supervisory committee appointed by the Dean of the Graduate School and composed of representatives of the Department of Education and of the various social science departments of the University.

Admission to this curriculum will be open to teachers of the social studies in public secondary schools who meet the general requirements for admission to the Graduate School. However, others will be considered eligible who meet the regular admission requirements, provided the following requirements are met before beginning the last full Quarter of work in residence necessary to obtain the degree:

(a) Certification or eligibility for certification by the Department of Education of the State of Ohio or by a state with comparable standards, as a teacher of the social studies; (b) a minimum of fifteen Quarter hours of credit in student teaching or its equivalent in approved teaching experience;(c) an adequate background in the social studies as judged by the Supervisory Committee.

A committee of three members of the instructional staff will be selected by the Supervisory Committee to assist the student in formulating a program for the Master's degree. Ordinarily, this committee will consist of one representative of the Department of Education and one each of the two social science departments.

The central element of the program will be Education 839, a seminar of three hours a Quarter, for three Quarters, for the coordination of the materials of subject matter fields and their application to the problem of secondary school teaching. The remainder of the program will ordinarily be selected from the social science fields and education. However, advisory committees may approve other courses when they believe such courses will better serve the needs of the students.

REQUIREMENTS FOR THE DEGREE OF MASTER OF DENTAL SCIENCE

Requirements for Admission. Requirements for admission to courses leading to the degree Master of Dental Science is graduation from a College of Dentistry whose entrance requirements were, at the time of graduation of the candidate, equivalent to those now designated by the Entrance Board for admission to the College of Dentistry, The Ohio State University, and whose curriculum was equivalent to that now obtaining in the College of Dentistry, The Ohio State University. One year of hospital internship or equivalent is recommended but not required. Candidates for the degree should be well grounded in one or more of the fundamental sciences such as anatomy, histology, physiology, bacteriology, pathology, physics or chemistry.

The program has been developed to give postdoctorate training in one of the specialties of Dentistry. The specialties offered are Orthodontics, Oral Surgery and Anesthesia, Prosthesis, and Periodontia.

Residence Requirement. A minimum of at least six Quarters of full-time work will be necessary to fulfill the residence requirement.

Language Requirement. Although a reading knowledge of German and French is desirable, it will not be a requirement for this degree unless the field of the candidate's investigation necessitates reference to publications in those languages.

Course of Study. Within the first three months of residence the candidate shall submit to the Dental Graduate Committee his proposed program designating the fields of his major and minor. The major shall be one of the specialties enumerated above and two-thirds of the period of residence shall be devoted to its study. The minor shall be in related basic sciences and one-third of the period of residence shall be devoted to its study. Courses in the related basic sciences are listed in the announcement of the Graduate School.

Thesis. Original work must form the basis of a thesis which every candidate shall submit. The subject of the thesis may be in the major or related minor fields and shall be submitted before the end of the third Quarter of residence. The subject of the thesis shall be approved by the candidate's adviser in his major and minor field, as well as by the Dental Graduate Committee. The thesis must show ability to work independently and give evidence of independent thought both in perceiving problems and in making satisfactory progress toward their solution. Familiarity with the bibliography of the special field and correct citation of authority are expected. Unanimous approval of the thesis by the thesis committee will be necessary for acceptance.

Requirements concerning the form in which the thesis shall be submitted as well as the time at which the thesis shall be submitted, the financial obligations and abstract of the thesis, are found on page 35.

General Examination. A conference will be held with the candidate at the end of the first six months of residence. A conference committee will be appointed by the Dean of the Graduate School on recommendation of the Dental Graduate Committee. The conference will be held for the purpose of determining the potentialities of the candidate for successfully completing the work which he has indicated he wishes to undertake.

The Final Examinations. *Before final oral and written examinations may be taken, certification of the candidate's ability to practice his major as a specialty must be given by those familiar with the candidate's work.*

The candidate shall be eligible for the final written examination in the field of the major after acceptance of thesis. This examination shall cover all work done in the major and may include any work in the fundamental related sciences.

The candidate shall be eligible for the final oral examination after all other requirements are satisfied, including the final written examination, the acceptance of the thesis and approval by those familiar with the work of the candidate and their certification that he is capable of practicing his major as a specialty of Dentistry. The final oral examination will include questions on the history of Dentistry with special reference to the candidate's major field, defense of his thesis, and questions on the related basic sciences.

The final written examination shall be held at least four weeks, and the final oral examination at least two weeks, prior to the Commencement at which the candidate expects to receive the degree. The examining committee shall be appointed by the Dean of the Graduate School on recommendation of the Dental Graduate Committee. The candidate's major adviser shall act as chairman. The time and place of the examination shall be set by the chairman of the examining committee after consultation with other members of the committee.

Financial Obligations. The candidate's attention is called to the schedule of fees of the Graduate School enumerated on pages 17 and 18. In addition to these fees, a non-returnable fee of $100 a Quarter is charged for all graduate work in Dentistry.

A few graduate assistantships in Dentistry are available. Application blanks may be obtained from the Dean of the College of Dentistry. Applications should be submitted not later than March 1 of the same year for which the assistantship is desired. A minimum of at least three years will be necessary to fulfill all requirements for the degree of Master of Dental Science if the candidate is a graduate assistant.

Candidates for this degree must also meet the general requirements regarding standard of work, admission to candidacy, abstract of thesis, etc., as are prescribed for the degrees Master of Arts and Master of Science by the Graduate School.

REQUIREMENTS FOR THE DEGREE OF MASTER OF MEDICAL SCIENCE

The degree of Master of Medical Science (M.M.Sc.) is granted, not on the basis of the successful completion of a definite amount of graduate work, but in recognition of the candidate's high attainment and ability in his special field as shown by the *preparation of a thesis* which is a definite contribution to knowledge and by an examination covering the candidate's special field of interest.

Admission. For admission to this course, the following requirements must be met: (a) a bachelor's degree or its equivalent from an approved college; (b) an M.D. degree from an approved college of medicine; (c) two years of internship in an acceptable hospital; (d) a capacity for independent work and research in some special field.

Language Requirement. Ordinarily a candidate should have a reading knowledge of French and German sufficient to enable him to read the literature of the field in which he is working. However, no formal language requirement is imposed. The language requirement in each individual case will be determined by the literature in the field. The professor in charge of the thesis (the student's adviser) will not accept a student until he is satisfied that all language deficiencies for effective work in that field have been removed.

Course of Study. Not later than the end of the first Quarter of graduate work, the candidate shall file in the office of the Graduate School a proposed program of study which must include the courses for which he proposes to register and the subject of his thesis. Both the program of study and the subject of the thesis must have the written approval of the student's adviser. No formal courses are required and in every case they will form a major part of the program. The emphasis will be on the *research work* to be completed and presented as a thesis.

Residence Requirement. At least six Quarters of graduate study will be necessary to meet the requirements for this degree. The period of residence is, however, a secondary requirement. The important requirements are the successful completion of an investigation and an examination in the special field. The student must be registered in the Graduate School during the period of residence.

Thesis. The thesis must give evidence of originality and power to carry on independent investigation. It must embody results of research which form a real contribution to knowledge and must show a mastery of the literature of the special field. The results of the investigation should be of such significance that they would always be suitable for publication in one of the learned journals in that field. Not later than a date which will be set by the office of the Graduate School, during the student's last Quarter of registration, two approved, typewritten copies of the thesis must be deposited in the Graduate School office. The thesis must be typed in accordance with specifications furnished by the Graduate School office. The student must deposit with the Bursar of the University the sum of $2.50 to cover the cost of binding the two copies of the thesis.

Final Examination. After the thesis has been completed and accepted, the Dean of the Graduate School shall appoint an examining Committee consisting of the candidate's adviser as chairman and at least two other members of the graduate faculty representing the same or allied fields of science. The examination may be either written or oral at the option of the committee. It shall have special reference to the thesis and the candidate's field of specialization. A unanimous affirmative vote of all members of the committee shall be necessary for the recommendation of the candidate for the degree. The chairman of the examining committee shall be responsible for arranging the

final examination and for certifying the results of the examination to the office of the Graduate School. This examination must be taken in the student's last Quarter of residence, not later than a date which will be set by the office of the Graduate School for each Quarter.

Candidates for this degree must also meet the general requirements regarding standard of work, admission to candidacy, abstract of thesis, abstract fee, etc., prescribed for the degrees, Master of Arts and Master of Science.

REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN PHARMACY

The degree of Master of Science in Pharmacy (M.Sc. in Pharm.) is essentially a research degree intended for those preparing for careers as teachers of pharmacy or research workers in that field. It is granted in recognition of the candidate's high attainment and ability in some special field of pharmacy, as shown by the preparation of a thesis which is a definite contribution to knowledge and by examinations covering the candidate's special field of interest.

Admission. The requirements for admission to the course of study leading to this degree is graduation with high standing from an accredited college of pharmacy whose entrance and graduation requirements are equivalent to those in effect for the College of Pharmacy of The Ohio State University. A Registered Pharmacist certificate or a year of practical experience is recommended but not required. Candidates for this degree should be well grounded in the biological and physical sciences which are fundamental to pharmacy.

Language Requirements. Ordinarily the candidate should have a knowledge of French and German sufficient to allow him to read the literature in his special field in pharmacy. However, no formal language requirement is imposed, the requirement being determined in each case by the literature in the field. A student without the necessary facility to read the literature in this field, will not be permitted to proceed with this degree.

Course of Study. Not later than the first Quarter of residence the candidate shall submit to the Graduate Committee in Pharmacy his program of study. It must show the subject of the proposed thesis and the courses to be undertaken in the field of specialization and in related fields. At least one-third of the period of residence must be devoted to the study of subjects cognate to pharmacy. Both the program of study and the subject of the thesis must have the written approval of the student's adviser and be filed in the office of the Graduate School immediately after being approved by the Graduate Committee in Pharmacy.

Residence Requirement. At least six Quarters of full-time graduate study will be necessary to meet the requirements for this degree. The period of residence is, however, a secondary requirement. The important requirements are the successful completion of the thesis and the prescribed courses and examinations in the candidate's special field. The student must be registered in the Graduate School during his entire period of residence for the degree.

Thesis. The thesis must give evidence that the candidate has the originality and power to carry on independent investigations and has mastered the literature of the field in which the thesis falls. The results embodied in the thesis should be of sufficient importance to justify their publication in a technical journal in that field. Not later than a date which will be set by the office of the Graduate School during the student's last Quarter of residence, two approved copies of the thesis and one approved copy of an abstract of the thesis must be deposited in the office of the Graduate School. The thesis must be typed in accordance with the specifications furnished by the Graduate School office. The student must deposit with the Bursar of the University the sum of $7.50

to cover the cost of binding the two copies of the thesis and for editing and printing the abstract.

Final Examination. After the completion and acceptance of the thesis, the Dean of the Graduate School shall appoint an examining committee consisting of the candidate's adviser as chairman and at least two other members of the graduate faculty representing the same or allied fields of science. The examination may be either written or oral or both at the option of the committee. It shall have special reference to the thesis and the candidate's field of specialization. A unanimous affirmative vote of all members of the committee shall be necessary for recommendation of the candidate for the degree. The chairman of the examining committee shall be responsible for arranging for the final examination and for certifying the results of the examination to the office of the Graduate School. The examination must be taken in the student's last Quarter of residence, not later than a date which will be set by the office of the Graduate School for each Quarter.

Candidates for this degree must also meet the general requirements regarding standard of work, admission to candidacy, abstract of thesis, etc., as are prescribed for the degrees, Master of Arts and Master of Science.

GRADUATE CURRICULA IN SOCIAL ADMINISTRATION

The special requirements for the degree Master of Arts in Social Administration are given on page 238 of this bulletin.

GRADUATE COURSE IN PUBLIC ADMINISTRATION

Special requirements for the degree Master of Science in Public Administration will be found on page 226 of this bulletin.

DEGREE OF MASTER OF BUSINESS ADMINISTRATION

GENERAL REQUIREMENTS

To receive the degree of Master of Business Administration students must comply with all the regular requirements laid down for the degrees, Master of Arts and Master of Science (see page 33). In addition to these requirements each candidate must meet the following general requirements.

Prerequisites. Before a student may become a candidate for the degree of Master of Business Administration or early in his Master's work he must have credit for the following subjects: Principles of Economics, Principles of Accounting, the equivalent of six Quarter-hours in Business Law, introductory courses in Corporation Finance, Industrial Management, Marketing, Economic Statistics, Money and Banking. (The specific courses noted may be taken during either the undergraduate or the graduate years.)

A thesis will be required of all candidates for this degree and the credit granted for the thesis shall not exceed six Quarter hours.

The credit granted for work in the field of specialization shall not be less than twelve nor more than twenty Quarter hours.

The candidate shall take work in at least three fields other than his field of specialization.

In addition to these general prerequisites, the department in which the candidate elects to specialize will have the following prerequisites:

The Department of Accounting: credit for additional courses in Business Law, three Quarter-hours; Public Finance, six Quarter-hours; Accounting, thirty-five Quarter-hours.

The Department of Business Organization: One course in either Transportation, Insurance, Public Utilities, or Economic Georgraphy for a student wishing to specialize in any one of the fields of Business Organization.

The Department of Geography: at least eighteen Quarter hours in courses

in Geography, including economic geography, the United States, and another regional course.

REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Scholastic Requirements. The general requirements for the degree of Doctor of Philosophy are: (1) A reasonable mastery of the field of specialization chosen, tested by a general comprehensive examination given approximately one year previous to the date on which the candidate expects to come up for the degree; (2) compliance with the language requirements as set forth in the paragraph entitled "Language Requirement," see below; (3) the presentation of an acceptable dissertation embodying the results of an original investigation; and (4) the passing of a final oral examination upon the dissertation and the immediate field in which the investigation lies.

Residence Requirement. At least three years of work devoted wholly to graduate study and investigation with suitable facilities and under proper supervision—or the equivalent thereof—are required for the completion of the residence requirement for the degree Doctor of Philosophy. Of these years, at least one, and that except by the permission of the Graduate Council, the last, must be spent in residence at this University. In case any part of the work is done elsewhere than in this University, such work shall be subject to the approval of the Graduate Council.

The residence requirement for the Ph.D. degree may not be satisfied by residence during Summers only. Three consecutive Quarters *in residence* are required after the Master's degree or after one year of graduate work where the Master's degree is not taken.

A candidate for the degree of Doctor of Philosophy must be registered in the Graduate School during the Quarter in which he expects to receive the degree.

Course of Study. The course of study to be pursued for the Doctor's degree will be arranged with each student by his adviser, but the choice of work must be approved as a whole by the Dean of the Graduate School. Work in other departments will be advised according to the needs of the individual student. In all cases the aim will be a reasonable concentration and a reasonable breadth of study, designed to foster both a knowledge of the specialty in relation to allied branches of learning and the power of productive scholarship.

Language Requirement. The foreign language requirements for the Ph.D. degree may be met by one of the two following methods: (1) A dictionary reading knowledge of two modern foreign languages; (2) a thorough reading knowledge of one modern foreign language.

The chairman of the department in which the candidate is specializing must notify the office of the Graduate School, in writing, of the method which the candidate will use in fulfilling the language requirements.

The modern foreign languages submitted under methods 1 and 2 must be languages in which there is a substantial body of scholarly literature bearing upon the student's field of specialization.

Before a student will be permitted to take his general examination, he must meet the language requirements. The language examinations are conducted by the language departments concerned and are given once each Quarter on a date announced at the opening of the Quarter. Blanks for taking these examinations must be obtained at the office of the Graduate School not later than ten days before these announced dates. The subject matter of the examination shall be drawn from the literature of the student's field of specialization.

It is suggested that students preparing for the language examinations consult the members of the Romance Languages or German Departments in charge of examinations *before* beginning such preparation.

No student will be permitted a re-examination in modern foreign languages

during the same Quarter in which he failed the examination. Permission for re-examination in subsequent Quarters can be granted only by the examiner, upon evidence of work done since the former examination, sufficient to justify a re-examination.

General Examination and Admission to Candidacy. Not later than the middle of the second Quarter prior to the Quarter in which he expects to come up for his degree, a student working for the degree of Doctor of Philosophy is required to pass a general comprehensive examination on the fundamentals of the entire field in which he has elected to specialize without limitation to the courses which the student has pursued. For example, a student who expects to come up for the degree at the end of the Spring Quarter must pass this general examination not later than the middle of the Autumn Quarter. He must be registered during the Quarter in which he expects to take the general examination unless excused by the Dean of the Graduate School. This examination must be a written one to be followed by an oral examination. The satisfactory passing of this examination carries with it admission to candidacy for the degree.

After admission to candidacy the candidate must be registered in the Graduate School for at least two more Quarters provided this will complete his residence requirement. Whenever a student is permitted to take the general examination without being registered, he must register for at least *three* more Quarters before coming up for the degree. He will be given complete freedom from all course requirements and will be registered for dissertation only. However, he will be permitted to audit any courses he may choose. No student will be permitted to take the general examination until after he has met the language requirements.

The general examination is conducted by a committee appointed by the Dean of the Graduate School, upon written request of the student's adviser. This committee shall consist of the student's adviser (who acts as chairman), and such other examiners as the Dean may designate, including at least one who is not a member of the department directly concerned. When the adviser decides that the student is ready for the general examination, he will so notify the office of the Graduate School, in writing, at the same time suggesting the personnel of the examining committee, for the approval of the Dean. After the committee has been approved by the Dean, appropriate blanks for reporting the results of the examination will be sent to the adviser. The selection of a time and place for the examination will be entirely in the hands of the adviser, but he is expected to consult with the various members of the committee before fixing a time for the examination. Immediately after the close of the examination the committee shall certify to the Graduate School, on the blank furnished the committee, whether or not the student has passed the examination. In order to be considered satisfactory, the report of the examining committee must be unanimous. However, when there is but a *single* dissenting vote the case is automatically referred to the Executive Committee with power to act.

If a candidate fails the general examination he cannot be re-examined until the examining committee recommends such a re-examination and the Graduate Council approves the recommendation. No candidate will be permitted to take the general examination more than twice.

Dissertation. A dissertation which is a definite contribution to knowledge of importance sufficient to warrant its publication shall be offered by the candidate. *A copy of the completed dissertation bearing the written approval of the candidate's adviser must be presented at the office of the Graduate School not less than four weeks previous to the end of the Quarter in which the degree is sought.*

The Dean, after consultation with the candidate's adviser, shall then appoint a Committee to consider the merit of the dissertation. In order to

expedite the reading of the dissertation by the committee, it is suggested that the first draft of the dissertation be accompanied by a written suggestion from the candidate's adviser concerning the personnel of the reading committee. The dissertation, together with the report of this Committee, shall be laid before the Council, who will then vote upon the question of its acceptance. In order to be considered satisfactory the report of the committee must be unanimous.

Each candidate must deposit in the office of the Graduate School, not later than a date which will be set by the Graduate School for each Quarter, two *approved* printed or typewritten copies of the complete dissertation, complying in form with specifications obtainable in the Graduate School office. The candidate must also deposit the sum of $2.50 with the Bursar of the University to cover the cost of binding these copies.

The Final Examination. The final examination is held after the approval of the dissertation. It shall be conducted by a committee consisting of the candidate's adviser (who shall act as chairman) and such other examiners as the Dean of the Graduate School shall designate, after consultation with the candidate's adviser, and shall include at least one person who is not a member of the department directly concerned. The time and place of the examination shall be set by the Chairman of the Examining Committee after consultation with the other members of the committee and the office of the Graduate School shall be promptly notified. The examination shall be oral and shall deal intensively with the portion of the candidate's field of specialization in which his dissertation falls, though it need not be confined exclusively to the subject matter of the dissertation. A written examination also may be required at the discretion of the department concerned. In order to be considered satisfactory the report of the examining committee must be unanimous. However, when there is but a *single* dissenting vote, the case is automatically referred to the Executive Committee of the Graduate Council with power to act.

Abstract of Dissertation. Each candidate must also deposit in the office of the Graduate School, not later than a date which will be set by the Graduate School for each Quarter, one *approved* typewritten copy of an abstract of the dissertation, not more than three thousand words in length. He must also deposit with the Bursar of the University, not later than a date which will be set by the Graduate School for each Quarter, the sum of $50.00 *in cash*. This sum will be used by the Graduate Council to defray the expenses connected with the editing, printing, and binding of the abstracts of dissertations.

COMMENCEMENT—CONVOCATION

A special Convocation or Commencement is held at the close of each Quarter for the conferring of degrees upon candidates who have fulfilled all the requirements of their respective courses.

ATTENDANCE AT CONVOCATION EXERCISES

All candidates for degrees are required to be present at their graduation convocation unless excused by the President.

RESEARCH INSTITUTES

The following institutes have been organized for furthering research in various fields in order to afford the facilities for carrying on research work whose confines are not limited to a single department:

(a) **The Plant Institute.** This institute affords the facilities of the Departments of Botany, Horticulture, Agricultural Chemistry and Agronomy.

(b) **The Social Science Institute.** This institute deals with problems which lie in two or more of the following departments: Business Organization, Business Research, Economics, Education, Educational Research, Geography, His-

tory, Law, Philosophy, Political Science, Psychology, Rural Economics, Social Administration, and Sociology.

UNIVERSITY ORGANIZATIONS

There are a number of organizations in the University of especial interest to the graduate students. The Gamma Alpha Fraternity, a graduate scientific society, has its own house at which a number of the members of the society live and a still larger number board. There is also the Graduate Club in social educational sciences and the Graduate Women's Club.

The main object of all of these clubs is to bring members together for social purposes and for the discussion of the various problems in which the individual members are interested.

There are also chapters of the national honorary societies, Phi Beta Kappa and Sigma Xi, as well as a number of honorary fraternities. In addition to these, nearly every department offering graduate work has its own graduate club.

UNIVERSITY LECTURES

Each year a number of lectures of special interest to graduate students are given by distinguished scholars from various educational institutions. Some of these lectures are of interest primarily to those in certain fields of work while others are of a general character and of interest to graduate students in general, no matter what their fields of activity may be.

DEPARTMENTS OF INSTRUCTION

The general prerequisites for courses open to graduate students with credit toward a degree are given below. In some departments more detailed prerequisites are required, and in all such cases a statement of these will be found in the description of the courses listed in the departments.

General prerequisites for courses numbered from 600 to 799:

At least junior standing and prerequisites that amount to 20 Quarter hours in the same and allied subjects of which a minimum of at least 10 Quarter hours must be in the same subject; or 30 Quarter hours in not more than two allied subjects.

Special prerequisites as stated in the description of courses must be included within these requirements.

Certain 600 courses in the field of education require as a prerequisite graduate standing in the field of education. These courses are appropriately designated in the list given under the general heading of "EDUCATION."

General prerequisites for courses numbered 800 or above:

These courses are open only to students registered in the Graduate School and have prerequisites that amount to 30 Quarter hours in the same and allied subjects, of which a minimum of 15 Quarter hours must be in the same subject.

COURSES OF GENERAL INTEREST

The courses listed below are of such a character as to be of general interest to all graduate students irrespective of their fields of specialization.

Survey Course 605. Foundations of Contemporary Civilization.

Survey Course 608. Development of Modern Science.

(For a full description of these courses see page 251 of this Bulletin, under the heading "Survey Courses.")

Philosophy 652. Philosophy of Science.

(For a detailed description of this course see page 193 of this bulletin.)

ACCOUNTING

Office, 309 Commerce Building

PROFESSORS TAYLOR, ECKELBERRY, AND MILLER, ASSOCIATE PROFESSORS HECKERT, DICKERSON, AND WILLCOX, ASSISTANT PROFESSORS SHONTING AND BURNHAM, MR. BOLON, MR. WALL

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," see page 45.

602. Advanced Principles of Accounting. Five credit hours. One Quarter. Autumn, Winter, Spring. Five class meetings each week. Mr. Eckelberry.

The accounting procedure in connection with corporate reorganizations and dissolutions. Consolidated balance sheets and income statements, branch house accounting, foreign exchange accounting.

603-604. Cost Accounting. Five credit hours. Two Quarters. 603, Autumn and Winter; 604, Winter and Spring. 603, four class meetings and one two-hour laboratory period each week. 604, five class meetings each week. Not open to students who are taking Accounting 624. Mr. Willcox.

The application of material, labor, and burden costs to the product under the order and process plans. The use of standards and other methods of control in production and distribution accounting. Laboratory practice in the use of tabulating and other equipment.

Given in the Summer of 1943.

607-608. Auditing. Two credit hours. Two Quarters. 607, Autumn and Spring; 608, Winter. General prerequisites must include Accounting 602 and 604. Mr. Wall, Mr. Eckelberry.

The various kinds of audits and their respective uses. Methods followed in verifying balance sheets and profit and loss accounts. Audit reports and certificates. Duties and responsibilities of an auditor.

Accounting 608 given in the Summer of 1943.

610. Cost Reports for Executives. Three credit hours. Winter Quarter. General prerequisites must include Accounting 604 or 624. Mr. Willcox.

A study of the principles underlying the preparation and use of operating reports. Some consideration will be given to the form and content of reports for both major and minor executives.

611. Introduction to Income Tax Accounting. Two credit hours. One Quarter. Autumn and Spring. Two class meetings each week. Mr. Wall, Mr. Dickerson, Mr. Burnham.

The accounting principles and procedure involved in the Federal taxes on income and profits. Practice in preparing simple income tax returns from the accounts of individuals and corporations.

612. Constructive Accounting. Four credit hours. One Quarter. Winter and Spring. Four class meetings each week. General prerequisites must include Accounting 603-604. Mr. Heckert, Mr. Willcox.

Practice in designing accounting systems for typical business enterprises. Consideration will be given to the use of tabulating and other equipment in expediting accounting records and reports.

613-614. Accounting Practice. Four credit hours. Two Quarters. 613, Autumn and Spring; 614, Autumn and Winter. Four class meetings each week. General prerequisites must include Accounting 602, 604, 611, and 616. Mr. Eckelberry, Mr. Burnham.

Practice in the solution of typical accounting problems. The class material is taken largely from the Certified Public Accountants' examinations of the various states.

Accounting 614 given in the Summer of 1943.

616. Business Statements. Three credit hours. One Quarter. Autumn, Winter, Spring. Three class meetings each week. Mr. Bolon, Mr. Eckelberry.

A study of the different kinds of statements prepared by corporations for the guidance of executives, directors, stockholders, and creditors. The methods used in preparing the necessary

statements together with the principles of statement interpretation. Use is made of current statements of well-known corporations. Lectures and problems.

Given in the Summer of 1943.

617. Managerial Accounting. Five credit hours. One Quarter. Winter and Spring. General prerequisites must include Accounting 602 and 604. Mr. Heckert.

The organization and function of the controller's department. The use of accounting and statistical data in the protection, control, planning, and coordination of business. Standards and budgetary procedure.

621. Tax Accounting. Two credit hours. Winter Quarter. General prerequisites must include Accounting 611. Mr. Miller, Mr. Dickerson.

A general survey of accounting aspects of various taxes. Practice in preparing returns for income, capital stock, payroll, estate, inheritance, gift and property taxes. Attention will be given to the inter-relationships of various taxes.

622. Advanced Accounting Theory. Three credit hours. Spring Quarter. General prerequisites must include Accounting 602.

An examination of some of the prevailing theories of accounting. Recent theories in connection with the valuation of assets; the determination of income and surplus. Each student is required to make a report covering the investigation of some particular subject.

624. Factory Costs. Five credit hours. One Quarter. Autumn, Winter, Spring. Five class meetings each week. Not open to students taking Accounting 603-604. Mr. Burnham.

The course is intended primarily for students whose major interest is in fields other than accounting. Emphasis is placed upon the accumulation of material, labor, and expense, cost of production and distribution and to the relationship between cost accounting work and that of other business departments.

626. Cost Accounting for Marketing Activities. Three credit hours. One Quarter. Autumn, Winter, Spring. Three class meetings each week. General prerequisites must include a course in intermediate accounting, a course in elementary economic statistics, and Business Organization 700. Not open to accounting majors. Mr. Heckert.

Special problems in accounting arising in the distributing activities of manufacturers, wholesalers, retailers, etc. Particular attention will be given to the allocation of expenses by activities, commodities, customers, channels and size of order; and to the cost of such functions as purchasing, warehousing, advertising, selling, delivery, credit and collections.

Lectures, assigned readings and problems on topics indicated.

630. Governmental Accounting and Budgeting. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include a course in intermediate accounting. Mr. Shonting.

The principles of accounting and budgeting for national, state, and local governments. A study of the fiscal structure of various forms of government. Budgeting and bugetary control. The application of accounting principles to government, with special reference to funds, appropriations, and allotments. The application of costs to governmental activities. The preparation of governmental financial statements and reports.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

804. Seminar in Accounting. Two credit hours. Autumn Quarter.

805-806. Seminar in Accounting. Two credit hours. Winter and Spring Quarters.

807. Distribution Costs. Three credit hours. Autumn Quarter. Three class meetings each week. General prerequisites must include a course in intermediate accounting, Business Organization 700, and Accounting 603-604 or permission of the instructor. Mr. Willcox.

Procedure and technique for analysis and control of distribution costs. Application of sorting and tabulating equipment to sales and expense analysis will be illustrated.

810. Advanced Federal Income Tax. Two credit hours. Autumn Quarter. General prerequisites must include Accounting 621. Mr. Dickerson.

Investigation of federal income tax problems and procedures. A conference course, subject to adaptation to individual needs of graduate students.

813. Advanced Auditing. Two credit hours. Spring Quarter. General prerequisites must include Accounting 608. Mr. Eckelberry.

Investigation of auditing problems, procedures, and auditors' reports. A conference course, subject to adaptation to individual needs of graduate students.

950. Research in Accounting. Autumn, Winter, and Spring Quarters.

Given in the Summer of 1943.

ADULT EDUCATION

(See Bureau of Special and Adult Education)

AERONAUTICAL ENGINEERING

Office, 247 Robinson Laboratory

601. Aerodynamics. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include Mechanics 610.

Aerodynamic forces; streamlines and velocity distribution; flow of non-viscous fluids; vortex laws; Kutta Joukousky law; viscosity effects; drag of flat plates and cylinders; boundary layers; Prandtl wing theory for finite wing; airfoil sections; propulsion and power required for flight.

610. Aircraft Stress Analysis. Five credit hours. Spring Quarter. Five recitations each week. General prerequisites must include Mechanics 615 and Aeronautical Engineering 601.

Applied and design loads; stress and strain relationships; beams with one axis of symmetry; work and strain energy; for bending and torsion; long and short column design; thin-walled columns of non-symmetrical shape; torsional instability of columns; plane and stiffened flat panel design.

AGRICULTURAL CHEMISTRY

Office, 211 Townshend Hall

PROFESSORS LYMAN, ALMY, AND BURRELL

Requirements for the Master's Degree: (a) *In Plant Chemistry*—Course work must include one year of organic chemistry with laboratory; at least two Quarters of physical chemistry with laboratory work; Agronomy 602 or its equivalent in quantitative analysis; plant physiology (Botany 605 and 606) and Agricultural Chemistry 601 or their equivalents. (b) *In the Chemistry of Food and Nutrition*—Course work must include twelve Quarter hours in organic chemistry with laboratory; Agricultural Chemistry 601, 602, and 607; Zoology 609; and two Quarters of physical chemistry with laboratory. (c) *In Food Analysis*—Course work must include the following, to be attained by previous advanced undergraduate work, or to be completed with other specified requirements for the Master's degree before the candidate shall be considered eligible for the degree: Agronomy 602 or two Quarters of quantitative analysis; Agricultural Chemistry 601, 602, and 607; Bacteriology 607 and 614; Organic Chemistry 647, 648, 649, 650; Physical Chemistry 681, 682, 691, 692 or their equivalents. (d) *In Dairy Chemistry*—Course work must include the following, to be attained by previous advanced undergraduate work, or to be completed with other specified requirements for the Master's degree before the candidate shall be considered eligible for the degree: Agricultural Chemistry 601, 602, 604, 605; Bacteriology 607; Organic Chemistry 647, 648, 649, 650; Physical Chemistry 681, 682, 691, 692 or their equivalents.

Requirements for the Ph.D. Degree: (a) *In Plant Chemistry*—Course work must include in addition to that specified for the Master's degree; a third Quarter of physical chemistry with laboratory; physiological methods (Botany 632 and 633); plant microchemistry (Botany 617); Agricultural Chemistry 607 and 801; and Chemistry 628 (spectroscopic analysis), 641 (qualitative organic analysis), and 642 (organic quantitative analysis). (b) *In the Chemistry of Food and Nutrition*—Course work must include, in addition to that specified for the Master's degree, a third Quarter of physical chemistry with laboratory; Chemistry 628 (spectroscopic analysis); 641 (qualitative organic analysis); and 642 (organic quantitative analysis); Bacteriology 607 and 614; Physiology 626 and 627; and Anatomy 613, 616, and 619. (c) *In Food Analysis*—Course work must include in addition to that specified for the Master's degree the following courses

or their equivalents: Chemistry 628, 641, 642, 695, 683, 693. (d) *In Dairy Chemistry*—Course work must include, in addition to that specified for the Master's degree, the following courses or their equivalents: Agricultural Chemistry 607; Bacteriology 610, 611, 614; Chemistry 628, 641, 642, 695, 683, 693.

At the end of the first year of residence study all candidates for the Doctor's degree must pass a general departmental examination.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. General Biological Chemistry. Five credit hours. One Quarter. Autumn and Winter. Three lectures and two three-hour laboratory periods each week. General prerequisites must include a course in general agricultural chemistry, or its equivalent in organic chemistry and quantitative analysis, together with five hours of biological science. Mr. Burrell.

A study of the chemistry of the fats, carbohydrates, proteins, and other compounds of biological importance, and the general chemistry of the metabolism of plants and animals. This course is intended for students majoring in biological subjects, and as a prerequisite to certain advanced courses in this department.

***602. Analysis of Food and Dairy Products.** Five credit hours. Spring Quarter. One lecture and twelve hours of laboratory practice each week. General prerequisites must include courses in general agricultural chemistry or the equivalent in organic chemistry and quantitative analysis. Given in alternate years. Mr. Almy.

Lectures and laboratory work on the composition of cereal foods, feeds, milk, butter, syrups and honey, cocoa and chocolate, extracts and alcoholic beverages.

***604. Advanced Dairy Chemistry.** Five credit hours. Autumn Quarter. Three lectures and two three-hour laboratory periods each week. General prerequisites must include Agricultural Chemistry 601 or fifteen hours of Agricultural Chemistry. Given in alternate years. Mr. Almy.

A survey is made of recent developments in the chemistry of inorganic and organic milk constituents. Laboratory work is based on preparations described in recent publications. A continuation and extension of the material discussed in elementary course in dairy chemistry.

***605. Advanced Dairy Chemistry.** Five credit hours. Winter Quarter. Three lectures and two three-hour laboratory periods each week. General prerequisites must include Agricultural Chemistry 604. Given in alternate years. Mr. Almy.

Advanced physicochemical relations of milk and dairy products. Foaming, adsorption phenomena, recent advances in colloidal chemistry of milk, and study of electrometric methods of measuring H-ion concentration, and oxidation-reduction potential, and oxidation-reduction systems in milk are some of the topics treated in lecture and laboratory.

607. Chemistry of Nutrition. Five credit hours. Spring Quarter. Two lectures and three three-hour laboratory periods each week. General prerequisites must include Agricultural Chemistry 601 and acceptable courses in physiology, or equivalent. Mr. Lyman.

Lectures on the chemistry of nutrition. Laboratory work includes experiments on digestion and utilization of food, determination of fuel value of food and the heat production of man under various conditions, the analysis of blood for waste products of metabolism, the effects on small animals of diets consisting of purified food constituents, and the effects of selected diets on the formation of waste products in the body.

610. Chemistry of Insecticides. Five credit hours. Winter Quarter. Three lectures and two three-hour laboratory periods each week. General prerequisites must include a course in general agricultural chemistry or equivalent and fifteen hours of biological science. Undergraduates will be permitted to register for this course only on permission of the instructor. Mr. Campbell.

Subject matter is confined to the inorganic insecticides and deals with the preparations, reactions, stabilities, chemical and physical nature and analytical procedures.

* Not given in 1943-1944.

611. Chemistry of Vitamins. Five credit hours. Spring Quarter. Three lectures and two three-hour laboratory periods each week. General prerequisites must include Agricultural Chemistry 601. Given in alternate years. Mr. Lyman.

Lectures on the isolation, synthesis, physiological effects, natural distribution and laboratory determination of vitamins. Laboratory work includes determination by physical and chemical methods of several of the vitamins.

***612. Cereal Chemistry.** Three or five credit hours. Winter Quarter. Two lectures and one or three laboratory periods each week. General prerequisites must include Agricultural Chemistry 601. Given in alternate years. Mr. Lyman.

This course is intended to give a survey of the field of cereal chemistry. The scope of the course is necessarily limited largely to the field of wheat flour, and bread chemistry. Although the lecture work deals with the major parts of the entire field, the laboratory work will make no effort to cover any of the various phases of experimental baking.

701. Special Problems. Three to fifteen credit hours, taken in units of three or five hours each Quarter for one or more Quarters. Autumn, Winter, and Spring Quarters. General prerequisites must include Agricultural Chemistry 601. The consent of the instructor is required. All instructors.

Students electing this course must have had at least two five-hour courses in the department. Consent of the department must be secured.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

801. Plant Chemistry. Five credit hours. Spring Quarter. Two lectures or discussions and three three-hour laboratory periods each week. General prerequisites must include Agricultural Chemistry 601 and Botany 605. Mr. Burrell.

The laboratory work includes a detailed, quantitative analysis of fresh plant tissue. The lectures and discussions center around: (1) a study of the chemical composition of plants in which "Official Methods" of analysis are reviewed and more recent methods evaluated; (2) a study of the results of such analyses with possible applications to the explanation of plant processes.

804. Seminar. One credit hour. Autumn, Winter, and Spring Quarters. Required of all graduate students majoring in agricultural chemistry. General prerequisites must include Agricultural Chemistry 601. Mr. Lyman.

950. Research in Agricultural Chemistry. Autumn, Winter, and Spring Quarters. Laboratory, library, and conference work. General prerequisites must include Agricultural Chemistry 701. The consent of the instructor is required. Mr. Lyman, Mr. Burrell, Mr. Almy.

Research may be done in nutrition, plant chemistry, food analysis, or dairy chemistry.

Given in the Summer of 1943.

* Not given in 1943-1944.

AGRICULTURAL EDUCATION
Office, 323 Campbell Hall

PROFESSORS STEWART AND FIFE, ASSOCIATE PROFESSOR KENESTRICK

Prerequisites for Graduate Work: In addition to major work in agricultural education the candidate must complete course work in at least three other areas of specialization in the field of general education, as determined by the candidate's advisory committee. By permission the candidate may use one area from the field of technical agriculture. He should have had at least one year of successful experience as a teacher of vocational agriculture, or administrative experience in agricultural education.

Departmental Committee on Graduate Work: A committee, including the Chairman of the Department, acts in an advisory capacity for graduate students and is in charge of the administration of the regulations of the Department.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. Special Methods of Teaching Vocational Agriculture in Secondary Schools. Five credit hours. One Quarter. Autumn, Winter, Spring. Two three-hour recitations each week. Mr. Stewart.

An intensive application of the information and practices given in the preceding departmental courses to the preparation of material for specific agricultural courses. The organization of subject matter for effective presentation in the classroom, the planning of lessons, laboratory work, and field trips, the methods of teaching through project supervision, and the organization of part-time courses

701. Special Problems. Three to fifteen credit hours, taken in units of three or five hours each Quarter. Autumn, Winter, and Spring Quarters. All instructors.

This course is intended for graduates who wish to work out problems in Agricultural Education including Agricultural Extension and Vocational Education in Agriculture.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

Special problems are designed particularly for the training of supervisors of agricultural education and trainers of teachers of vocational agriculture.

***802. Practicum in Agricultural Education.** Four credit hours. The equivalent of five two-hour periods each week for discussions, laboratory work, and reports. Open only to teachers of vocational agriculture. Designed as a service course based upon the specific problems of teachers of vocational agriculture. By permission of the Graduate Council, teachers of vocational agriculture, by reason of their extended employment, will not be required to be in residence the entire term. Permission of the instructor.

Discussions, investigations, and reports will be planned and developed in those areas of needs as expressed by the teachers. Assignments in smaller groups will be made where needs so indicate.

†**803. The Problem Method Applied to Secondary and College Teaching in Agriculture.** Five credit hours. Winter Quarter. Permission of the instructor must be obtained. Mr. Stewart.

An inquiry into the conditions that promote effective teaching with a determination of procedures that contribute to this end. The possibilities of the problem method in agricultural education are fully explored.

Given in the Summer of 1943.

†**804. State Administration and Supervision of Vocational Agriculture.** Three credit hours. Spring Quarter. Three discussion periods each week. Mr. Fife.

A course devoted to a consideration of the following: federal and state legislation relating to vocational agriculture; state plans; records and reports; standards and objectives; teacher

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

training in service; supervisory procedures; state courses of study; placement and recommendations of teachers; promotion of state program; day, evening, and part-time school organizations; and other problems relating to the state administration and supervision of vocational agriculture.

Given in the Summer of 1943.

†805. **Developing Individual Farming Programs for All-Day Students of Vocational Agriculture.** Three credit hours. General prerequisites must include teaching experience in vocational agriculture or permission of the instructor. Students expecting to enroll in this course should communicate with the instructor at least three weeks prior to the beginning of the Quarter in order to arrange for the collection of data on specific problems. Mr. Kenestrick.

The selection, planning, conduct, and evaluation of programs, with emphasis on the analysis of project records in terms of efficiency factors, the use of comparisons to determine the association between practices followed and outcomes secured, and the utilization of the findings of such analyses and comparisons in teaching.

Not open to students who have credit for Agricultural Education 705.

Given in the Summer of 1943.

†806. **Organization and Administration of Teacher Training for Vocational Agriculture.** Three credit hours. Winter Quarter. Five discussion periods each week. Mr. Stewart.

A course devoted to a consideration of the following: state plans for resident teacher training; working relations between teacher training departments and state supervisory organization; teacher training courses offered; analysis of the content of teacher training courses; provisions for observation and practice teaching; research in agricultural education; teacher placement and follow-up program.

Given in the Summer of 1943.

*807. **Evaluation and Measurement in Vocational Agriculture.** Three credit hours.

This course is concerned with the development of objectives and the formulation of evaluative and measuring devices in vocational agriculture based upon such objectives. Particular attention will be given to recent progress in the evaluation of teaching, teacher-training, and supervisory programs.

†808. **Organization and Methods of Conducting Part-Time and Evening Schools in Vocational Agriculture.** Three credit hours. Winter Quarter. Three discussion periods each week. In addition to the general prerequisites, teaching experience in vocational agriculture or permission of the instructor is required. Students expecting to enroll in this course should communicate with the instructor at least two weeks prior to the beginning of the Quarter in order to arrange for the collection of data on specific problems.

A course devoted to an analysis of the problems related to part-time and evening schools in vocational agriculture and to the development of objectives and procedures in the organization and conduct of such instruction.

Given in the Summer of 1943.

810. **Seminar in Agricultural Education.** Three to five credit hours. Autumn, Winter, and Spring Quarters. All instructors.

A study of current problems in agricultural education. Provision for investigation, reports and discussion.

950. **Research for Teachers of Vocational Agriculture.** Three credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include eight hours of graduate work. Mr. Fife.

A course devoted to a study of research techniques and procedures appropriate to studies and researches in the field of agricultural education. The course will direct students to a study of procedures in the promotion of research with individual projects in planning, organizing, and projecting appropriate studies.

Not open to students who have credit for Agricultural Education 809.

Given in the Summer of 1943.

* Not given in 1943-1944.
† Not given during the academic year, 1943-1944.

AGRICULTURAL ENGINEERING
Office, 105 Ives Hall

PROFESSORS McCUEN, MILLER, AND OVERHOLT, ASSISTANT PROFESSOR RICHY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

The general prerequisites include fundamental courses in agricultural engineering, agronomy, mathematics, and physics.

602. Advanced Farm Structures. Five credit hours. Winter Quarter. Three recitations and two three-hour laboratory periods each week. General prerequisites must include courses in animal husbandry. Mr. Miller.

Advanced study of farm building programs, coordinating engineering, biological, economic and social factors. The general design and details of construction for units and entire farmsteads.

603. Advanced Farm Power Equipment. Five credit hours. Autumn Quarter. Three recitations and two three-hour laboratory periods each week. Mr. McCuen.

Trends in design and application of modern farm power equipment. The farm tractor and its complement of power equipment, such as combines, threshers, feed mills, corn harvesters, will be used as a basis in a study leading toward power programs for economical production.

604. Advanced Drainage and Irrigation. Five credit hours. Spring Quarter. Three recitations and four hours laboratory each week. In addition to the general prerequisites, a course in land surveying. Mr. Overholt.

Advanced study of conservation of soil by agricultural engineering structures to control erosion, and of soil water regulation through drainage and irrigation systems. A coordination of the biological, engineering, and economic factors involved in individual systems; also, cooperation problems in state and community programs for economic land utilization.

605. Advanced Field Machinery. Five credit hours. Spring Quarter. Three recitations and two three-hour laboratory periods each week. Mr. Richey.

An advanced study of soil-working, planting, and forage-handling machine from the mechanical, operational, and economic standpoint; including a term problem analyzing the machinery, power, and labor requirements and costs on the student's home (or other) farm.

701. Special Problems. Three to fifteen credit hours, taken in units of three or five hours each Quarter for one or more Quarters. Autumn, Winter, and Spring Quarters. All instructors.

Students selecting this course must have had at least two five-hour courses in the department, one of which must have been a 600 course in line with the problem chosen. Consent of the department must be secured.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Agricultural Engineering. Autumn, Winter, and Spring Quarters. Library, conference, and laboratory work. Permission of the department required. Mr. McCuen, Mr. Miller, Mr. Overholt, Mr. Richey.

AGRICULTURAL EXTENSION
Office, 124 Townshend Hall

PROFESSORS RAMSOWER (DIRECTOR), SPOHN (SUPERVISOR OF PROJECTS AND PROGRAMS), AND PRICE (STATE LEADER OF HOME DEMONSTRATION WORK)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

***600. Extension Education.** Five credit hours. Spring Quarter. Five recitations each week. Given in alternate years. Mr. Spohn.

The application of psychology and principles of education to the program and methods used in extension work.

* Not given in 1943-1944.

701. Special Problems. Three to fifteen credit hours, taken in units of three or five hours each Quarter. Autumn, Winter, and Spring Quarters.

This course is intended for graduates who wish to work out problems in Agricultural Education including Agricultural Extension and Vocational Education in Agriculture.

FOR GRADUATES

800 and 900 Courses. A statement of the gneral prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

800. Extension Education. Three credit hours. Autumn, Winter, and Spring Quarters. Mr. Ramsower, Miss Price.

The course will deal with the program of Extension Education pertaining to organization of content and methods in the field of Extension.

The course will be organized for workers in the fields of Agricultural Extension and Home Economics Extension.

AGRONOMY

Offices, 102 Horticulture Building and 203A Townshend Hall

PROFESSORS LEWIS, CONREY, PARK, AND WILLARD, ASSOCIATE PROFESSOR LAMB, ASSISTANT PROFESSORS BATCHELOR, McCLURE, AND SALTER

OHIO AGRICULTURAL EXPERIMENT STATION RESEARCH ASSOCIATES YODER, STRINGFIELD, SAYRE, EVANS, AND MORRIS

Research in Agronomy is concerned with fundamental investigations of the physical, chemical and biological proccesses and responses in soils and in field crops, and with the organization of the findings into scientific systems of soil management and of crop production. Suggested areas of graduate specialization are: soil fertility, soil management, soil chemistry, soil physics, physical chemistry of soils, soil biology, soil genesis and morphology, soil conservation, field crop management, seed production, field crop ecology, field crop physiology, field crop breeding, and experimental methods in agronomy.

Prerequisites for Graduate Work: A student proposing to major in agronomy should have exhibited high undergraduate scholarship in such basic sciences as mathematics, chemistry, agricultural chemistry, physics, botany, genetics, and geology. If the undergraduate training is inadequate in any science fundamental to the proposed area of specialization, it will be necessary to make up the deficiency. A candidate for admission to graduate work in agronomy will find it advantageous to have a working knowledge of soils and field crops, though he need not have specialized in agronomy as an undergraduate.

Requirements for the Master's and Ph.D. Degrees: Each graduate student is required to prepare a statement of his proposed research according to the outline used for projects of the agricultural experiment stations. Once a year a progress report of the research, together with any modifications or revisions of the original project outline, is to be submitted to the departmental committee on graduate instruction.

Programs of candidates for the doctorate must be approved by the departmental committee on graduate instruction. Except in special cases, all "600" courses in the department are to be taken for credit. Candidates for the doctorate are expected to audit Agronomy 501, 502, and 503, unless these courses or thir equivalents have been taken previously.

Cooperation with the Ohio Agricultural Experiment Station: Association with the Ohio Agricultural Experiment Station provides facilities for laboratory and greenhouse investigations at Wooster as well as at Columbus and for field experiments at Wooster, Columbus, and at thirteen district and county experiment farms. Most of the graduate advisers in agronomy are also members of the staff of the Agricultural Experiment Station; several are full-time members.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. Organization of Soil and Crop Management Systems. Three credit hours. Winter Quarter. Two lectures and one discussion period each week. Mr. Conrey, Mr. Lewis.

Recognizing, correlating and solving soil and crop problems relating to the improvement of soil resources and to efficient production and use of field crops. Practical application of chemical, physical, biological, and economic information and experience to the building of soil and crop management systems for various types of farming.

*602. Chemical Methods Used in Soils Investigations. Five credit hours. Autumn Quarter. Two lectures and nine laboratory hours each week. Given in alternate years. Mr. McClure.

The fundamentals of inorganic quantitative analysis as applied to soils, fertilizers, and liming materials.

603. Origin and Classification of Soils. Five credit hours. Spring Quarter. Four lectures and one three-hour laboratory period each week. Mr. Conrey.

The characteristics of soils as developed under various climatic conditions and their application in soil classification with special reference to Ohio conditions. Laboratory study of soil characteristics, field trips to several of the important soil areas in Ohio.

604. Soil Erosion and Its Control. Five credit hours. Autumn Quarter. Four lectures and one three-hour laboratory period each week. Mr. Conrey.

A study of the nature, causes, occurrences and economic importance of soil erosion, and of the methods and agencies for its control. Field trips for study of erosion in different regions of the state with visits to erosion experiment station and demonstration control areas.

605. Soil Microbiology. Five credit hours. Autumn Quarter. Three lectures and two two-hour laboratory periods each week. Given in alternate years. Mr. Batchelor.

The isolation and study of the morphology of important soil microorganisms and of their biochemical transformations, such as nitrogen accumulation and loss, organic matter decomposition, oxidation and reduction, and their applications to practical soil management.

607. Field Crop Breeding. Five credit hours. Winter Quarter. Three two-hour lecture-laboratory periods each week. Given in alternate years. In addition to the general prerequisites, a course in botany and a course in heredity. Mr. Lewis.

Applications of the science of genetics and the art of plant breeding to the improvement of field crops. Detailed studies of the basic principles and methods used in the development and selection of superior varieties, strains, and hybrids of grain, meadow and pasture crops. Emphasis is also given to the problems of obtaining effective and intelligent use of new and improved strains of field crops.

608. Soil Physics. Five credit hours. Winter Quarter. Three lectures and two three-hour laboratory periods each week. In addition to the general prerequisites, a course in physics. Mr. McClure.

A study of the physical makeup and properties of soil, including structure, thermal relationships, consistency and plasticity, water and air relationships, and the nature of the colloidal fraction.

609. Physical Chemistry of Soils. Five credit hours. Spring Quarter. Three lectures and two three-hour laboratory periods each week. General prerequisites must include Agronomy 602 or 608. Mr. McClure.

A study of the origin, nature and physico-chemical behavior of colloidal clay and organic matter in relation to soil acidity, base exchange and fixation of nutrients.

701. Special Problems. Three to fifteen credit hours. May be taken in units of three or five credit hours for one or more Quarters. Autumn, Winter, and Spring Quarters. The consent of the instructor is required. All instructors.

Problems involving library, laboratory or field study in plant breeding, weed control, field experimentation, special crops or special soils problems may be selected.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

801. Agronomy Seminar. One to three credit hours. Autumn, Winter, and Spring Quarters. The consent of the instructor is required.

Topics for 1943-1944:

Autumn Quarter: Applications of Colloidal Chemistry to Soils and Plants. Mr. Yoder.
Winter Quarter: Theories and Practices in Soil Fertility. Mr. Conrey, Mr. McClure.
Spring Quarter: Ecology of Field Crops. Mr. Willard, Mr. Lewis.

* Not given in 1943-1944.

950. Research in Agronomy. Autumn, Winter, and Spring Quarters.

Research in soil fertility, soil management, soil chemistry, soil physics and physical chemistry, soil biology, soil genesis and morphology, and soil conservation under the direction of Mr. Conrey, Mr. Yoder, Mr. McClure, Mr. Salter, Mr. Batchelor.

Research in field crop breeding, field crop management, seed production, field crop ecology, field crop physiology, and experimental methods in Agronomy, under the direction of Mr. Lewis, Mr. Willard, Mr. Park, Mr. Stringfield, Mr. Sayre, Mr. Lamb, Mr. Morris, Mr. Evans.

Given in the Summer of 1943.

AMERICAN HISTORY
(See History)

ANATOMY
Office, 410 Hamilton Hall

PROFESSORS BAKER, KNOUFF, AND EDWARDS, ASSOCIATE PROFESSORS SETTERFIELD AND PALMER, ASSISTANT PROFESSORS GRAVES, KIRK, AND OSBORN, MR. FOULKS

Prerequisites for all major work in the Department: Students desiring to major in anatomy should follow the three-year curriculum designed for premedical students. See page 57 in the bulletin of the College of Arts and Sciences.

General prerequisites for graduate work in anatomy:

1. An undergraduate major in anatomy or its equivalent is the minimum requirement for graduate work in the Department. The College of Arts and Sciences requires a minimum of 40 Quarter hours in the major field during the last two years in college and permits a maximum of 60 hours in the major field.

2. The course requirements for an undergraduate major in anatomy, of which 25 hours must be in the Anatomy Department, are as follows:

a. Required courses
Anatomy 613, 616, 619
b. Elective courses in anatomy
Anatomy 617, 650, 604, 701, 611
c. Elective courses in allied fields
Physiology 626, 627, 628
Bacteriology 607, 655, 656, 657, 658, 617, 618, 619
Zoology 601, 509, 610, 605, 617, 618, 620
Psychology 601, 602, 603, 610, 611, 622, 624, 634, 641
Sociology 501
Physiological Chemistry 611, 612, 613

Students from schools other than Ohio State University should evaluate their offerings in terms of the courses listed above. No graduate credit in the Department of Anatomy can be given for Anatomy 613, 616, or 619. Graduate credit is given for courses in the B group which have not been used to fulfill the requirements for an undergraduate major.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

604. Anatomical Methods. Three or five credit hours. One Quarter. Winter and Spring. One conference and the equivalent of four or eight laboratory or study hours each week. The staff.

This course is designed for and limited to anatomy majors desiring to begin investigative work.

A study of the various techniques employed in anatomical research. Permission of the adviser must be secured.

611. Comparative Histology. Five credit hours. Autumn Quarter. Two lectures and nine laboratory hours each week. General prerequisites must include Anatomy 613, 616, and 619, or Zoology 617 and 720. Either Zoology 609 or Anatomy 604 is recommended. Enrollment is limited to twenty-five students and the permission of the instructor is required. Mr. Knouff.

A general consideration of the fundamental animal tissues. Available invertebrate material will be examined although special emphasis will be placed on the vertebrate forms.

613. Comparative Anatomy of the Vertebrates. Five credit hours. Winter Quarter. Two lectures or recitations and two three-hour laboratory periods each week. General prerequisites must include elementary courses in zoology. A course in evolution is recommended. Mr. Setterfield.

The comparative anatomy of the Elasmobranchs, Amphibians, and mammals as illustrated by the shark, frog, and fetal pig.

Given in the Summer of 1942.

616. Comparative Vertebrate Embryology. Five credit hours. Autumn Quarter. Three lectures or recitations and two three-hour laboratory periods each week. General prerequisites must include Anatomy 619 or its equivalent. Mr. Foulks.

The development of the chick and pig with special emphasis on the formation of fetal membranes and on mammalian organogenesis.

617. Elementary Neurology. Five credit hours. Autumn Quarter. Two lectures or recitations and nine laboratory hours each week. General prerequisites must include Anatomy 611 or equivalent. Mr. Setterfield.

A brief review of the brain and cranial nerves of the shark; the morphology of the spinal cord and brain of a mammal; the principal tracts and nuclei (reaction systems) of the cord and brain with special reference to the human nervous system.

Given in the Summer of 1943.

619. Comparative Anatomy of the Vertebrates. Five credit hours. Spring Quarter. Two lectures or recitations and six laboratory hours each week. General prerequisites must include Anatomy 613 or equivalent. Mr. Setterfield.

The anatomy of the mammals with special reference to the cat.

621-622-623. Human Anatomy. Five credit hours. Autumn, Winter, and Spring Quarters. Two lectures or recitations and ten laboratory hours each week. Open only to students in medicine and to students doubly registered in the College of Medicine and the Graduate School. Mr. Baker, Mr. Palmer, Mr. Kirk.

The gross anatomy of the thorax and abdomen; of the extremities and perineum; of the head and neck.

624. Histology. Five credit hours. Winter Quarter. Two recitations, one lecture, and nine laboratory hours each week. Open only to students in medicine and to students doubly registered in the College of Medicine and the Graduate School. Mr. Knouff, Mr. Setterfield, Mr. Foulks.

The general histology of epithelial, connective, blood, and nervous tissues and the vascular system.

625. Histology. Five credit hours. Spring Quarter. Two recitations, one lecture, and nine laboratory hours each week. Open only to students in medicine and to students doubly registered in the College of Medicine and the Graduate School. Mr. Knouff, Mr. Setterfield, Mr. Foulks.

Special histology and embryology of the integumentary, digestive, respiratory, urogenital, and endocrine systems.

626. Neuro-Anatomy. Five credit hours. Autumn Quarter. Two recitations, one lecture, and nine laboratory hours each week. Open only to students in medicine and to students doubly registered in the College of Medicine and the Graduate School. Mr. Palmer, Mr. Graves.

The gross anatomy and histology of the nervous system including sense organs with special reference to the reaction systems.

628. Special Advanced Anatomy. Three credit hours. One Quarter. Autumn, Winter, Spring. One conference or lecture and six laboratory hours each week. General prerequisites must include Anatomy 623 or 639 and the consent of the instructor is required. Open only to students registered in the College of Medicine or Dentistry and to students doubly registered in the College of Medicine or Dentistry and the Graduate School. Mr. Edwards, and assistants.

Students will select or have assigned to them special regions for dissection and study.

638-639. Human Anatomy. Seven credit hours. Winter and Spring Quarters. Two recitations and fifteen laboratory hours each week. Open only to students in Dentistry and to students doubly registered in the College of Dentistry and the Graduate School. Mr. Edwards.

The gross anatomy of the body with special stress on the anatomy of the head and neck, including the osteology of these parts.

640. Histology. Five credit hours. Autumn Quarter. Three recitations and nine laboratory hours each week. Open only to students in Dentistry and to students doubly registered in the College of Dentistry and the Graduate School. Mr. Knouff, Mr. Setterfield.

The general histology of the tissues and the special histology of the integumentary, skeletal, vascular, digestive, respiratory, urogenital and nervous systems.

641. Topographical Anatomy. One credit hour. Winter Quarter. Three hours of laboratory including lecture or quiz each week. General prerequisites must include Anatomy 638-639, 640. Open only to students in Dentistry and to students doubly registered in the College of Dentistry and the Graduate School. Mr. Edwards, Mr. Trippy.

The topographical relations of structure of the head and neck as displayed by prepared sections, museum demonstrations, models, roentgenograms and correlated dissections with special attention to intimate correlation of the subject matter with operative dentistry.

650. A Survey of Anatomy. Five credit hours. Winter Quarter. Two lectures, one discussion period and six laboratory or library hours each week. General prerequisites must include four Quarters in Anatomy. Recommended for anatomy majors. The staff.

The objectives of this course are first to survey the history and development of anatomical knowledge and second, to correlate the subject matter of anatomy and associate major advances in the field of anatomy with the leading investigators. Present day trends in anatomical research will be discussed and an attempt made to introduce students to accepted procedures in original investigation.

700. Applied Sectional Anatomy. Two credit hours. Spring Quarter. One lecture or recitation and two laboratory hours each week. General prerequisites must include Anatomy 621, 622, and 623. Open only to students in medicine and to students doubly registered in the College of Medicine and the Graduate School. Mr. Graves, Mr. Baker, Mr. Palmer.

The topographical relations of gross anatomy based on surface and sectioned material.

701. Minor Problems in Anatomy. Three to five credit hours. Autumn, Winter, and Spring Quarters. One conference and four to eight laboratory and/or library hours each week. General prerequisites must include the equivalent of a major in anatomy or allied departments. The staff.

This course is designed to permit any properly qualified person to avail himself of the library and laboratory facilities of the department for carrying out a minor investigation or for adding to his knowledge and technique in some anatomical subject.

721-722-723. Primate Anatomy. Five credit hours. Autumn, Winter, and Spring Quarters. Two lectures or recitations and ten laboratory hours each week. Permission of the instructor is required. Mr. Baker, Mr. Edwards, Mr. Palmer, Mr. Graves.

A regional and systemic study of the primate body for advanced students of Comparative Morphology with special reference to the ontogenetic and phylogenetic history of the organ systems.

724. Advanced Mammalian Histology. Five credit hours. Winter Quarter. Two recitations, one lecture, and nine laboratory hours each week. Permission of instructor is required. Mr. Knouff.

The general histology of epithelial, connective, blood, and nervous tissues and the vascular system.

725. Advanced Mammalian Histology. Five credit hours. Spring Quarter. Two lectures, one recitation, and nine laboratory hours each week. Permission of instructor is required. Mr. Knouff.

The special histology and embryology of the integumentary, digestive, respiratory, urogenital, and endocrine systems.

726. Neurology. Five credit hours. Autumn Quarter. Two recitations, one lecture, and nine laboratory hours each week. Permission of the instructor is required. Mr. Palmer, Mr. Graves.

The subject matter included in this course is chiefly concerned with the gross morphology, microscopic structure and the reaction systems of the primate nervous system and sense organs.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

807. Special Problems in Anatomy. Credit hours to be arranged. Autumn, Winter, and Spring Quarters. Permission of the instructor is required.

The student will select or be assigned special topics in one of the following fields of Anatomy:

(a) Problems in endocrinology. Mr. Knouff.
*(b) Special studies in blood and connective tissues. Mr. Knouff.
*(c) Special studies in embryology. Mr. Knouff.
(d) Advanced comparative morphology. Mr. Baker, Mr. Edwards, Mr. Setterfield.
*(e) Problems in microscopic anatomy. Mr. Knouff.
(f) Special studies in neurology. Mr. Palmer.

830. Anatomy Seminar. One credit hour. Autumn, Winter, and Spring Quarters. Required of all candidates for the Doctor's degree in anatomy during the second year in the Graduate School and thereafter. Mr. Knouff, Mr. Baker, Mr. Edwards, Mr. Setterfield.

This course consists of discussions of research in progress and reports from the literature of current anatomical problems.

950. Research in Anatomy. Autumn, Winter, and Spring Quarters. General prerequisites must include the equivalent of a major in anatomy, including Anatomy 604 and 701. The staff.

ANCIENT HISTORY AND LITERATURE

A program leading to the degree of Master of Arts may be arranged in the combined fields of Ancient History and the Classical Languages. Such a program must be approved by Mr. McDonald of the Department of History, Mr. Titchener of the Department of Classical Languages, and the Dean of the Graduate School.

ANIMAL HUSBANDRY

Office, 203 Plumb Hall

PROFESSORS KAYS, GAY, COFFEY, SALISBURY, AND SUTTON,
ASSISTANT PROFESSOR KUNKLE

All work leading to a graduate degree in this department shall be done under the supervision of a graduate committee which shall consist of the chairman of the department, a member of the staff chosen by the chairman and the student's adviser. This committee shall pass on a candidate's fitness for the work, prescribe his course, and approve his thesis plans before he proceeds.

The areas of specialization for graduate work in the Department of Animal Husbandry are animal nutrition, animal genetics, animal production and meats.

For unconditional admission to graduate work in this department, a student must have an accumulative point hour ratio of 3 or better (an average of B or better) in his undergraduate studies.

Basic prerequisites for all undergraduate students in Animal Husbandry shall include acceptable courses in phyciology. In addition students interested in animal nutrition should have credit in academic courses in agricultural or biological chemistry equivalent to Agricultural Chemistry 601; those interested in animal genetics should have credit in academic courses equivalent to Zoology 403.

* Not given in 1943-1944.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

GENERAL LIVE STOCK PRODUCTION

608. Live Stock Marketing. Five credit hours. Winter Quarter. Five lectures each week. General prerequisites must include a course in feeding live stock and Rural Economics 613. Mr. Henning.

The various agencies and organizations involved in the marketing of live stock will be studied. Methods of selling, basis of sale, choice of markets, grade price differentials will be reviewed. The problems of transportation and financing will be considered. Emphasis will be placed on recent developments, concentration, direct to packer marketing, costs of marketing, management, public relations and other problems in live stock marketing.

***611. Advanced Live Stock Breeding.** Five credit hours. Winter Quarter. Three lectures and two two-hour laboratory periods each week. General prerequisites must include a course in heredity, a course in breeding live stock, and permission of the instructor.

The function of the progeny test as a tool for measuring the genetic potentialities of sires and dams; pedigree analysis and other aids to selection; systems of breeding; the utilization of artificial insemination as a means for more rapid live stock improvement; discussions of recent contributions and research in animal breeding.

DAIRY PRODUCTION

614. Methods and Techniques in Animal Husbandry Investigations. Five credit hours. Autumn Quarter. Three lectures and one four-hour laboratory period each week. General prerequisites must include twenty hours in animal husbandry courses and permission of instructor in charge. Mr. Sutton.

A course designed to cover the experimental work being pursued at the leading experiment stations. Experimental procedures of nutrition, milk secretion and reproduction studies.

616. Dairy Inspection Trip. No credit hours. An inspection trip of approximately two weeks, without credit, will be required of all students specializing in dairy production. Mr. Salisbury.

The purpose of this inspection trip is to study at first hand the leading breeding herds, commercial dairies and research programs in operation in the Eastern part of the country.

626. Marketing of Dairy Products. Three credit hours. Winter Quarter. Two lectures each week. General prerequisites must include Rural Economics 613. Mr. McBride.

A study of assembling, transportation and marketing of dairy products, with special reference to Ohio. Attention will be given to changing market areas, producers' cooperative movements and manufacturers' consolidation activities. One or two inspection trips of two or three days will be made.

SPECIAL PROBLEMS

GENERAL LIVE STOCK PRODUCTION AND DAIRY PRODUCTION

701. Special Problems. Three to fifteen credit hours. Given in units of three to five hours a Quarter for one or more Quarters. Autumn, Winter, Spring. Mr. Gay, Mr. Kays, Mr. Coffey, Mr. Salisbury, Mr. Sutton, Mr. Kunkle.

Special assignments in the advanced phases of any of the lines of animal and dairy production and meats. Students will elect work in desired subjects after conference with the instructor in charge.

NOTE: Student desiring work in animal nutrition, see Agricultural Chemistry 601 and 607.

†705. Meats and Dairy Production. (For teachers of Vocational Agriculture.) Four credit hours. Four hours daily, to be divided equally between Meats and Dairy Production. Enrollment to be determined by facilities available. Mr. Kunkle, Mr. Salisbury.

The Meats offering will include laboratory and discussion sessions on meat and meat products. Grading, identification of cuts and utilization methods of all grades of beef, pork, veal, and lamb will receive appropriate consideration.

The course in Dairy Cattle Production will be devoted to a discussion of problems which

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

confront the teacher of vocational agriculture under present agricultural conditions. In addition, the class schedule in connection with this course will provide opportunity to study Dairy Cattle in the laboratory.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

This will include at least two years' study of the types and breeding of live stock with collateral work in the principles of breeding, feeding and management.

950. Research in Animal Husbandry. Autumn, Winter, and Spring Quarters.

Research work in Animal Husbandry is conducted under the direction of Mr. Gay, Mr. Kays, Mr. Coffey; in Dairy Production under the direction of Mr. Salisbury; in Nutrition under the direction of Mr. Sutton; and in Meats under the direction of Mr. Gay, Mr. Kunkle.

ARCHITECTURE AND LANDSCAPE ARCHITECTURE

Office, 119 Brown Hall

PROFESSORS CHUBB, BRADFORD (EMERITUS), BAUMER, RONAN, AND SMITH, ASSOCIATE PROFESSOR SUTTON, ASSISTANT PROFESSORS OMAN, BUCK, TROTTER, AND MEINHARDT

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," see page 45.

ARCHITECTURE

770-771-772. Architecture: Special Studies in Architecture. One to five credit hours. Autumn, Winter, and Spring Quarters. All instructors.

These courses are open by permission of the department to graduate students desiring to pursue special studies not offered in the fixed curricula.

LANDSCAPE ARCHITECTURE

701. Landscape Architecture: Special Problems. Two to ten credit hours. Autumn, Winter, and Spring Quarters. Prerequisite, third or fourth year standing. Mr. Sutton, Mr. Trotter.

This course is open, by permission of the department, to students in the Graduate School and those who wish to pursue special studies in landscape architecture not offered in the fixed curricula.

ART

(See Fine Arts)

ASTRONOMY

(See Physics and Astronomy)

BACTERIOLOGY

Office, 210 Pharmacy and Bacteriology Building

PROFESSORS HUDSON, MORREY (EMERITUS), STARIN, AND WOOLPERT, ASSOCIATE PROFESSORS BIRKELAND, MARKHAM, AND STAHLY, ASSISTANT PROFESSOR WEISER

Requirements for the Master's Degree: (a) The course requirements for the Master's degree are not rigidly fixed, but in addition to his major work the candidate should take courses in fundamental biology, chemistry (organic and physiological), comparative anatomy, physics and mathematics. The choice and number of allied courses are arranged by conferring with the

adviser and depend on the student's field of specialization in bacteriology and on his previous training. (b) A thesis based on independent research is required as a part of the student's scientific training. (c) The candidate must pass a written preliminary examination, dealing with the material of the basic courses in bacteriology and allied sciences, before the end of the second Quarter preceding the Quarter of expected graduation. (d) Final written and oral examinations must be passed at least two weeks before the date of graduation and after the submission and approval of the student's thesis.

Requirements for the Degree Doctor of Philosophy: (a) In order to be considered worthy of undertaking work toward the Doctor's degree, a student must display notable ability in bacteriology and allied sciences, an aptitude in research, and facility in the use of the English language. To demonstrate the student's fitness in these respects, the Department may require an examination. (b) An advisory committee is appointed for each student to aid in arranging his program and in carrying it to completion. The sequence of courses to be taken in the Department and the choice of work in allied fields depend on the student's previous training and objectives. An understanding of the basic techniques and concepts of biology, chemistry, physics, and mathematics is required. Ordinarily not more than one-third of the credit hours toward the degree should originate outside the Department. (c) The student must pass the language requirements of the Graduate School before appearing for a preliminary examination. (d) The student is required to pass a preliminary oral examination covering the fundamentals of bacteriology and allied sciences not later than the fifth Quarter preceding the Quarter of graduation. The general examination and the final examination are taken in accordance with regulations of the Graduate School. (e) The dissertation, embodying the research of the candidate must represent a contribution to science and be of a publishable grade of excellence. It must be submitted to the advisory committee not less than six weeks prior to the date of graduation. If accepted by the committee, it is transmitted to the Dean of the Graduate School for approval. Two final copies of the dissertation and an abstract must be deposited in the office of the Graduate School and one copy of each with the advisory committee.

The prerequisites for all courses in this group consist of ten hours of biological sciences and fifteen hours of chemistry in addition to any other prerequisites stated in the descriptions of the courses.

Students intending to specialize in bacteriology should take in addition to their major work courses in botany, zoology, organic and physiological chemistry, physics, physiology, comparative anatomy, histology, pathology, dairy technology, or agronomy, depending upon the student's field of interest in bacteriology and his previous training.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

607. General Bacteriology. Five credit hours. One Quarter. Autumn and Spring. Two lectures, one recitation, and three two-hour laboratory periods each week. Mr. Stahly, Mr. Weiser.

This course is a prerequisite to all elective courses in the department and is designed to prepare for special work. The lectures consider the botanical relationships of bacteria, their morphology, classification, effect of physical and chemical environment, action on food material, etc. The laboratory work includes preparation of the ordinary culture media and making of cultures on these media, staining methods, and some typical biochemical actions.

Not open for graduate credit to students majoring in bacteriology.

Given in the Summer of 1943.

608. Introduction to Pathogenic Bacteriology. Three credit hours. Spring Quarter. Three class periods each week. General prerequisites must include Bacteriology 607. Mr. Birkeland.

A general course designed to acquaint students with those bacteria causing disease in man: their habitats and modes of transmission, and an elementary consideration of the immunological processes involved. Designed primarily for students who desire a general knowledge of the field and not for students majoring in bacteriology.

Given in the Summer of 1943.

610. Dairy Bacteriology. Three credit hours. Winter Quarter. Three class periods each week. General prerequisites must include Bacteriology 607. Mr. Weiser.

Sources and kinds of bacteria in milk and in normal milk fermentation. Uses of bacteria in butter making, and of bacteria and fungi in cheese making. Bacteria involved in unnatural milk fermentation and methods of control.

611. Dairy Bacteriology. Three credit hours. Winter Quarter. Three three-hour laboratory periods each week. Bacteriology 607 and 610 must be

included in the general prerequisites. However, 610 may be taken concurrently. Mr. Weiser.

Laboratory work on the organisms discussed in Bacteriology 610.

614. Bacteriology of Food, Water, and Sewage. Five credit hours. Winter Quarter. Three class periods and three two-hour laboratory periods each week. General prerequisites must include Bacteriology 607. A previous course in pathogenic bacteriology is recommended or may be taken concurrently. Mr. Weiser.

A study of the effects of microorganisms on foods, and methods of food preservation. Bacterial flora of water and sewage in relation to water purification and sewage disposal.

Particular emphasis is placed upon the role of sanitation and public health regulations in the control of infectious diseases transmitted through food, water, and sewage.

617. Immunology. Three credit hours. One Quarter. Autumn and Spring. Three class periods each week. General prerequisites must include Bacteriology 607 and 608, or equivalent. Mr. Starin, Mr. Markham.

A discussion of the general principles of immunity, including toxins and antitoxins, bactericidal substances, agglutinins, precipitins, opsonins, etc.

618. Immunology. Three credit hours. One Quarter. Autumn and Spring. Three three-hour laboratory periods each week. General prerequisites must include Bacteriology 607 and 608, or equivalent. Mr. Starin, Mr. Markham.

Laboratory work in the preparation of toxins, antitoxins, antibacterial substances, bacterial vaccines, and in the serological methods of diagnosis.

*619. Pathogenic Protozoology. Three credit hours. Spring Quarter. Three class periods each week. General prerequisites must include Bacteriology 607, 608, and 609, or equivalents. Mr. Markham.

The various pathogenic protozoa of man and domestic game animals are considered, with special attention to amebae and plasmodia of malaria. Emphasis is placed on the principles of parasitism involved and on insect transmission.

*624. History of Bacteriology and Allied Fields. Three credit hours. Spring Quarter. Lectures, conferences, and library work. General prerequisites must include Bacteriology 607, 655, 656, 657, 658, and 617, or equivalents. Mr. Starin, Mr. Markham.

This course is designed for students majoring in bacteriology. Its purpose is to acquaint the student with the historical development of bacteriology, immunology, and allied fields, to introduce him to the principal workers in the various fields, and to show how their contributions are related to our present concepts.

Not open to students who have credit for Bacteriology 627.

626. Special Technique in Pathogenic Bacteriology. Five credit hours. Winter Quarter. Conferences, library, and laboratory work. General prerequisites must include Bacteriology 607, 655, 656, 657, 658, or equivalents. Mr. Starin.

A course in technique in which the student is thoroughly trained in working with such material and methods as are encountered in board of health and hospital laboratories.

633. Advanced General Bacteriology. Five credit hours. Spring Quarter. Two lectures, one recitation, and three two-hour laboratory periods each week. General prerequisites must include Bacteriology 607. Mr. Stahly.

A course concerned with an advanced and detailed study of the basic phenomena of bacterial morphology, composition, growth, cultivation, variation, and classification.

635. Physiology of Bacteria. Three credit hours. Autumn Quarter. Three class periods each week. General prerequisites must include Bacteriology 607, 655, 656, 657, 658 or equivalents and two Quarters of organic chemistry. Mr. Stahly.

Studies of bacterial metabolism including enzymes, mechanisms of biochemical changes and products. Uses of bacteria in fermentation industries.

* Not given in 1943-1944.

649. **Filterable Viruses.** Three credit hours. Spring Quarter. Three lectures each week. General prerequisites must include Bacteriology 607, 655, 656, 657, 658, 617, and 618, or equivalents. Mr. Hudson, Mr. Markham.

Lecture and demonstration course on the nature and action of filterable viruses as ultramicroscopic parasites of man, animals and plants.

655. **Pathogenic Bacteriology.** Three credit hours. Winter Quarter. Three class periods each week. General prerequisites must include Bacteriology 607. Mr. Markham.

A study of some of the important organisms causing disease in man. Modes of transmission, methods of protection against infections, and immunological relationships. Designed for students majoring in bacteriology, those preparing for work in diagnostic laboratories, and others desiring a more comprehensive knowledge than is provided in Bacteriology 608.

Not open to students who have credit for Bacteriology 608.

Given in the Summer of 1943.

656. **Pathogenic Bacteriology.** Three credit hours. Winter Quarter. Three three-hour laboratory periods each week. General prerequisites must include Bacteriology 607. Mr. Markham.

Laboratory work with some important bacteria causing disease in man. Includes study of the cultural and staining characteristics, methods of identification and diagnosis, and animal experimentation. Designed to accompany Bacteriology 655.

Not open to students who have credit for Bacteriology 609.

Given in the Summer of 1943.

657. **Pathogenic Bacteriology.** Three credit hours. One Quarter. Autumn and Spring. Three class periods each week. Designed for students majoring in bacteriology. General prerequisites must include Bacteriology 607, 655, and 656, or equivalents. Mr. Starin, Mr. Birkeland.

A continuation of Bacteriology 655, including a study of those organisms pathogenic for man, not covered in the preceding course. Modes of transmission, methods of protection against infection, and immunological relationships. Lectures, conferences, and reports.

Not open to students who have credit for Bacteriology 625 or 631.

658. **Pathogenic Bacteriology.** Three credit hours. One Quarter. Autumn and Spring. Three three-hour laboratory periods each week. General prerequisites must include Bacteriology 607, 655, and 656, or equivalents. Concurrent with Bacteriology 657. Mr. Starin, Mr. Birkeland.

A continuation of Bacteriology 656.

Not open to students who have credit for Bacteriology 625 or 632.

701. **Minor Investigations.** Three or five credit hours each Quarter. Autumn, Winter, Spring. A student may enter at the beginning of any Quarter. General prerequisites must include Bacteriology 607, 655, 656, 657, 658, 617, and 618, or equivalents. Department staff.

This course is designed for such students as have completed the equivalent of two years' work in bacteriology and are still undergraduates. The work will be outlined by the instructor in charge to meet the individual student's needs.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

807-808-809. **Seminar in Bacteriology.** One credit hour. Autumn, Winter, and Spring Quarters. Required of all graduate students majoring in bacteriology. Department staff.

950. **Research in Bacteriology.** Autumn, Winter, and Spring Quarters. General prerequisites must include acceptable courses in the chosen field of research. Department staff.

Given in the Summer of 1943.

BOTANY

Office, 102 Botany and Zoology Building

PROFESSORS TRANSEAU, STOVER, SAMPSON, AND MEYER, ASSOCIATE PROFESSORS WALLER, BLAYDES, AND ALLISON, ASSISTANT PROFESSORS TAFT, SCOFIELD, AND LAMPE, MR. WOLFE, MR. SWANSON

Requirements for Advanced Degrees: In addition to the requirements of the Graduate School, candidates for the Master's degree should have had, prior to taking the comprehensive examination, acceptable courses in general botany, general zoology, local flora, plant physiology, plant morphology, ecology, plant pathology, and organic or biological or agricultural chemistry. Additional courses required will depend upon the student's field of specialization, and will be decided upon in consultation with the student's adviser.

Candidates for the Doctor's degree, in addition to meeting the language and other requirements of the Graduate School, and the course requirements for the Master's degree, must select, in consultation with their advisers, such additional courses in botany and other science departments as will form a broad foundation for research in plant science.

Students may specialize in certain phases of plant physiology, morphology, pathology, ecology, genetics, and taxonomy.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. Plant Ecology. Five credit hours. Autumn Quarter. Three lectures and one three-hour laboratory period each week. Mr. Transeau, Mr. Wolfe.

Lectures on the vegetation of the Eastern United States with special reference to the plant associations and formations of Ohio. Field work on the associations of the vicinity of Columbus and their successions. Reading of important literature. Several Saturday field trips.
Given in the Summer of 1943.

602. Plant Ecology. Five credit hours. Spring Quarter. Three lectures and one three-hour laboratory period each week. General prerequisites must include Botany 601. Mr. Transeau, Mr. Wolfe.

General principles of ecological plant geography. A discussion of associations and successions of the major divisions of the vegetation of North America. Assigned readings of the more important literature. Several Saturday field trips.

605. Plant Physiology. Five credit hours. One Quarter. Autumn and Winter. Three lectures and two two-hour laboratory periods each week. Mr. Meyer, Mr. Scofield, Mr. Swanson.

The physiology of absorption and movement of water, salts, and gases in plants. The properties of water, solutions, and colloids; permeability, diffusion, absorption, transpiration, and the movement of water in plants.
Given in the Summer of 1943.

606. Plant Physiology. Five credit hours. One Quarter. Autumn, Winter, Spring. Three lectures and two two-hour laboratory periods each week. General prerequisites must include Botany 605. Mr. Meyer, Mr. Scofield, Mr. Swanson.

The physiology of nutrition, growth and movement; photosynthesis, other syntheses, enzymes, digestion, translocation, accumulation, assimilation, respiration, fermentation, growth and movement.

611. Evolution of Plants. Three credit hours. Spring Quarter. Lectures and assigned readings. Miss Lampe.

The evolution of the plant kingdom with a general discussion of the problems and factors involved.

613. General Morphology of Thallophytes and Bryophytes. Five credit hours. Autumn Quarter. Four two-hour laboratory periods each week. Mr. Blaydes.

A study of the life histories of the algae, fungi, liverworts, and mosses. The laboratory work will consist of a study of the vegetative and reproductive structures of the several groups.

614. General Morphology of the Pteridophytes and Spermatophytes. Five credit hours. Winter Quarter. Four two-hour laboratory periods each week. Miss Lampe.

A study of the comparative structures and life histories of the ferns, gymnosperms, and angiosperms, giving particular attention to the structure and development of seed plants.

615. Plant Microtechnic. Five credit hours. Winter Quarter. Two lectures and three two-hour laboratory periods each week. Mr. Blaydes.

Principles and methods of killing, fixing, imbedding, sectioning, staining, and mounting plant materials for microscopic study.
Given in the Summer of 1943.

617. Plant Microchemistry. Five credit hours. Autumn Quarter. One lecture and three two-hour laboratory periods each week. General prerequisites must include Botany 605 and 606. Desirable antecedents, general inorganic and organic chemistry. Mr. Sampson.

The identification *in situ* of organic and inorganic substances found in plant tissues by microchemical methods. These methods are of special value in determining plant substances within the cells and in the study of physical and chemical changes accompanying plant processes and plant responses. This applies particularly to the numerous local regions in plants too small to be attacked by the test-tube method of tissue analysis.

619. Economic Botany. Five credit hours. Autumn Quarter. Four lectures and one two-hour laboratory period each week. Desirable, concurrently or as antecedent, ecology or advanced geography. Consult instructor before registering. Mr. Waller.

The world's sources of food, fibers, oils, rubber and other products examined from the standpoint of their ecology. In the laboratory the study of raw materials and products will illustrate ways plants are used by man.

632. Physiological Methods. Three credit hours. Spring Quarter. Six laboratory hours each week. Botany 605-606 must be included in the general prerequisites or taken concurrently, except by special permission of the instructor. Mr. Meyer, Mr. Scofield.

Methods of measuring the physical factors of the environment that influence plant growth and development, both under laboratory and field conditions. Methods of growing plants under controlled conditions for experimental work. Conferences, readings, and laboratory work.

633. Physiological Methods. Three credit hours. Winter Quarter. Six laboratory hours each week. Botany 605-606 must be included in the general prerequisites or taken concurrently, except by special permission of the instructor. Mr. Meyer, Mr. Scofield.

A laboratory course in the methods of plant physiology such as measurements of H-ion concentration, osmotic values, permeability, enzyme activity and the processes of transpiration, respiration, and photosynthesis. Conferences, readings and laboratory work.

634. Plant Growth. Three credit hours. Spring Quarter. Three lectures each week. Consult instructor before registering. Mr. Sampson.

A study of the physiology of growth. Special attention is given to the interrelated effects of internal and external factors upon growth, movement and reproduction in plants. Bibliographies and reviews of literature.

635. Plant Genetics. Five credit hours. Spring Quarter. Five recitations each week. General prerequisites must include a course in heredity. Mr. Waller.

The study of heredity in plants. Theories of the transmission of heritable characteristics. Research methods in the study of inheritance.

637. Plant Cytology. Three credit hours. Spring Quarter. Three two-hour laboratory periods each week. General prerequisites must include four Quarters of biology. Given biennially, alternating with Botany 640. Miss Lampe.

The structure, ontogeny, divisions and fusions of plant cells.

NOTE: Either 637 or 640 will be given in 1943-1944, depending on the relative number of applications. Students planning to take either course should consult Mr. Blaydes.

*640. Plant Anatomy. Three credit hours. Spring Quarter. Three two-hour laboratory periods each week. General prerequisites must include four Quarters of biology. Given biennially, alternating with Botany 637. Mr. Blaydes.

The origin and development of the organs, and tissue systems of vascular plants, and comparative study of the structures of roots, stems, leaves, flowers, and fruits. This course is a desirable antecedent to advanced work in physiology and pathology.

NOTE: Either 637 or 640 will be given in 1943-1944, depending on the relative number of applications. Students planning to take either course should consult Mr. Blaydes.

645. Principles of Taxonomy: Pteridophytes and Gymnosperms. Three credit hours. Autumn Quarter. Three two-hour laboratory periods each week. General prerequisites must include Botany 614 or its equivalent. Given biennially, alternating with Botany 646. Miss Lampe.

A study of the origin and evolution of the ferns and gymnosperms, and a general consideration of the origin of the angiosperms.

*646. Principles of Taxonomy: Monocots and Dicots. Three credit hours. Autumn Quarter. Three two-hour laboratory periods each week. General prerequisites must include Botany 614 or its equivalent. Desirable antecedent, Botany 645. Given biennially, alternating with Botany 645. Miss Lampe.

The progressive development of characters in the monocots and dicots.

653. Mycology. Three credit hours. Autumn Quarter. Three two-hour laboratory periods each week. Mr. Stover.

Study of the classification, structure, reproduction, and life histories of the Basidiomycetes, including the rusts and smuts. Collection and identification of fungi available during the autumn months, edible and poisonous mushrooms, wood-destroying fungi, and other interesting species.

654. Mycology. Three credit hours. Spring Quarter. Three two-hour laboratory periods each week. Mr. Stover.

Study of the classification, structure, reproduction, and life histories of the Phycomycetes and Ascomycetes. Attention is given to the collection and identification of the fungi available during the spring months, including molds, mushrooms, and plant disease fungi.

656. Advanced Plant Pathology. Three credit hours. Winter Quarter. Three two-hour laboratory periods each week. General prerequisites must include a course in general plant pathology. Mr. Stover, Mr. Pierstorff.

Designed for students in botany, entomology, horticulture, and agronomy. Each student may select for study the diseases of those plants in which he is primarily interested.

665. Freshwater Algae. Three credit hours. Spring Quarter. Three two-hour laboratory periods each week. General prerequisites must include six Quarters of biological work. Consent of the instructor is required. Mr. Taft.

Conference, laboratory, and library course on the classification, morphology, and ecological relations of the freshwater algae.

701. Special Problems: Taxonomy, Morphology, Physiology, Cytology, Plant Pathology, and Anatomy. Two to five credit hours each Quarter. Autumn, Winter, Spring. The staff.

Given in the Summer of 1943.

NOTE: TEACHING COURSES. For the Teaching Course in this department see the Department of Education, Course 683.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 46.

810. Botanical Colloquium. One credit hour. Autumn, Winter, and Spring Quarters. Required of all graduate students majoring in botany. All instructors.

812. Seminar in the History of Botany. One credit hour. Winter Quarter. Recommended for all graduate students majoring in botany. Mr. Waller.

* Not given in 1943-1944.

950. Research in Botany. Autumn, Winter, and Spring Quarters.
Research work in taxonomy, morphology, anatomy, cytology, physiology, genetics, plant pathology, or economic botany is offered by various members of the staff. Mr. Transeau, Mr. Stover, Mr. Sampson, Mr. Waller, Mr. Meyer, Mr. Blaydes, Miss Lampe, Mr. Taft, Mr. Scofield. Given in the Summer of 1943.

BUREAU OF BUSINESS RESEARCH
Office, 206 Commerce Building

PROFESSOR BOOTHE, ASSISTANT PROFESSORS YOCUM AND KELLOGG, MR. ARNOLD

The purposes of the Bureau of Business Research are to facilitate the research activities of the faculty and the graduate students of the College of Commerce and Administration and at the same time to make cooperative studies in business and industry which will be valuable in the commercial and industrial development of the state. Through its research activities and its monthly business review, *The Bulletin of Business Research*, the Bureau maintains continuous contacts with representatives of trade and industry in the state, as well as with research and administrative departments of the Federal, State, and local governments.

For many years the Bureau of Business Research has served as the central coordinating agency for research in problems of business operation and of basic economic trends in the state. The Bureau sponsors each year a state and regional Conference of Statisticians on Business Research.

The Bureau maintains physical equipment such as adding and calculating machines, tabulating machines, typewriters, duplicating equipment, etc., as well as a technical and clerical staff. These facilities, in so far as possible, are available to members of the instructional staffs of the various departments of the College of Commerce, to graduate students where researches of a quantitative nature can be undertaken only with the cooperation of a research organization, and for demonstration of machine procedures and techniques to undergraduate classes. There is also maintained a specialized research library in the field of business and industrial statistics. Researches which meet the standards of the Bureau are published as books, monographs, or special studies of the Bureau and given widespread circulation by the Bureau.

BUREAU OF EDUCATIONAL RESEARCH
Office, 200, 201 Arps Hall

PROFESSORS HOLY, ANDERSON, DALE, ECKELBERRY, AND RATHS, ASSOCIATE PROFESSOR TYLER, ASSISTANT PROFESSORS MacLATCHY, MOONEY, AND WOELFEL, MR. FLESHER, MISS SEEGER, MRS. EWAN, RESEARCH ASSOCIATES AND ASSISTANTS

The major purpose of the Bureau of Educational Research is to promote the scientific investigation of educational problems in the College, in the University, and in the public schools of the State. To facilitate its work, two steps were taken in the Autumn of 1942. The first of these was the action of the Board of Trustees on October 11, 1942, which authorizes the President of the University to assign staff members from other departments in the University to the Bureau for full-or part-time services to carry on approved investigations. The second of these was the setting up of an Advisory Committee consisting of the Vice President, the Dean of the Graduate School, the Dean of the College of Education, a representative from each of the departments in the College and from the Departments of Agricultural Education and Home Economics Education, and the major members of the Bureau staff.

Library. The research library contains large quantities of material in the form of manuscripts, pamphlets, bulletins, reports, modern textbooks for elementary and high-school grades, and educational periodicals. This library is

in charge of a reference librarian, and her services together with the library material, are utilized in the preparation of bibliographies and reports on problems presented by those engaged in educational work.

Courses. In order to make the resources of the Bureau serve for research purposes, students desiring to work in the Bureau may register in certain courses listed in the departments of Education and Psychology. Courses must be approved by the chairman of the department and by the Director of the Bureau. Such students will be under the direction and supervision of the Bureau staff members.

Research Problems. Students taking such courses are given practical problems upon which to work. According to the nature and exacting character of the problem and the scholastic status of the student, he may be registered in either of two groups of courses, as follows:

MINOR PROBLEMS. Two to four credit hours. Investigation of minor problems.
Education 600
Psychology 650

INDIVIDUAL PROBLEMS. Two to ten credit hours. Investigation of problems leading to preparation of theses for advanced degrees.
Education 950
Psychology 950

NOTE: Descriptions of these courses, prerequisites, and the divisions into which the two Education courses are divided will be found under the department announcements.

BUREAU OF SPECIAL AND ADULT EDUCATION

Office, 321 Arps Hall

PROFESSORS BERRY, NISONGER, AND SANDERSON, ASSOCIATE PROFESSOR ROSEBROOK

The function of the Bureau of Special and Adult Education is to promote the education of all types of exceptional children (the handicapped and the gifted) and to further the work of adult education.

Qualified students in training may secure under adequate supervision practical field experience in special or adult education, or in psycho-educational work.

Students interested in the work of this Bureau should confer with the Director.

SPECIAL EDUCATION

Field Service. The objectives of field service are as follows: to assist the smaller communities in organizing the work of special education; to serve in an advisory capacity the communities in which special education has already been organized; and to cooperate with state and local organizations in formulating a state program for the protection, treatment and training of all types of exceptional children and for the removal of the causes that handicap children.

Teacher Training. Only persons who have had successful experience in teaching normal children should prepare to teach exceptional children. A student who wishes to prepare to teach mentally retarded children, behavior problem children, or children defective in speech should select courses from those recommended below.

Candidates for the degree of Bachelor of Science in Education interested in teaching exceptional children should register in the Curriculum in Elementary Education. In this curriculum students are required to elect 20 additional hours in some one selected field at the junior-senior level. Those interested in special education may meet this requirement by choosing electives from the courses listed below.

All types of exceptional children

Psychology 609. Exceptional Children: General Survey
Psychology 613. Mental and Educational Tests
Psychology 615. Psycho-Educational Diagnosis and Treatment
Psychology 616. Individual Testing by the Binet-Simon Method

Psychology 618. Clinical Tests
Psychology 619. Psychological Clinic
Psychology 620. Advanced Psychological Clinics
Psychology 661. Psycho-Educational Problems
Psychology 669. Gifted Children
Psychology 683. Psychology of Reading
Education 764. Supervised Teaching in Special Classes
Education 767. The Education of Exceptional Children
Education 800-l. Seminar in Special Education

Mentally retarded children

Psychology 611. Mentally Deficient Children
Psychology 622. Delinquent Children
Education 458. Wood and Metal Work
Education 765. Principles and Methods of Teaching the Mentally Retarded

Behavior problem children

Psychology 622. Delinquent Children
Psychology 634. Criminal and Legal Psychology
Psychology 641. Abnormal Psychology
Education 766. Principles and Methods of Teaching Behavior Problem Children
Sociology 625. Criminology
Psychology 671. Principles of Testing the Problem Child

Children defective in speech

Speech 656. Visual Hearing Techniques
Speech 692. Clinical Practice in Speech Correction
Speech 694. Speech Disorders Survey
Speech 816. Speech Pathology
Speech 504. Speech Functions and Responsibilities of the Teacher
Education 675. Spoken English: Teachers' Course

Research. Students interested in research problems connected with the work of the Bureau of Special and Adult Education may register in any of the following courses:

Psychology 650. Minor Problems
Psychology 950. Research in Psychology
Education 600-l. Minor Problems
Education 950-l. Research in Education
Speech 700. Minor Problems in Speech
Speech 950. Research in Speech

ADULT EDUCATION

Field Service. The aims of field service are as follows: to aid in the organization of adult study groups; to assist organized groups in formulating programs of study; to prepare and issue courses of study, bulletins and other materials for the use of adult groups; and to cooperate with state and local organizations in furthering the work of adult education.

University Courses. Students interested in taking work in adult education may enroll in any of the following courses:

Education 600-l. Minor Problems
Education 770. Adult Education
Education 898. Planning Community Adult Education Programs
Education 950-l. Research in Education
Psychology 650. Minor Problems
Psychology 670. Psychological Problems of Adult Life
Psychology 679. Psychology of Public Attitudes
Psychology 950. Research in Psychology
Agricultural Extension 501. Extension Methods
Agricultural Extension 600. Extension Education

NOTE: Description of the courses listed above will be found under the department announcements, with the exception of those at the "800" and "900" level which are described in the Graduate School Bulletin only. See College of Agriculture Bulletin for Agricultural Extension 501 and 600.

BUSINESS ORGANIZATION

Office, 107 Commerce Building

PROFESSORS MAYNARD, WEIDLER, HOAGLAND, DICE, HELD, DUFFUS, BECKMAN, AND DAVIS, ASSOCIATE PROFESSORS PIKE, REEDER, CORDELL, DAMERON, POWER, NOLEN, DONALDSON, AND BURLEY, ASSISTANT PROFESSORS RIDDLE, KIMBALL, KELLOGG, C. W. BOWERS, LEY, AND JUCIUS

Prerequisites for Graduate Work: The Department of Business Organization offers majors leading to the degrees Master of Business Administration or Master of Arts. In each case, the program is based on the assumption that the candidate will have adequate undergraduate training in economics and business organization subjects. Specifically, each candidate must present undergraduate work as indicated below or pursue courses in this University of equivalent nature. Such courses will be taken in addition to the Graduate School requirements of forty-five hours of graduate work for the degree in question.

Minimum undergraduate requirements are:

(a) Business Law—six Quarter hours
Principles of Economics—ten Quarter hours
Principles of Accounting—ten Quarter hours
Economic Statistics—four Quarter hours
Money and Banking—five Quarter hours
Business Finance—five Quarter hours
Marketing—five Quarter hours
Industrial Management or Labor Economics—five Quarter hours

(b) One of the following four courses:
Public Utility Economics—five Quarter hours
Principles of Insurance—three Quarter hours
Transportation Economics—five Quarter hours
Economic Geography—five Quarter hours

For requirements for the degrees Master of Business Administration and Doctor of Philosophy, see pages 40 to 43 of this bulletin.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

614. Business Statistics. Four credit hours. One Quarter. Winter and Spring. Three class meetings and one two-hour laboratory period each week. General prerequisites must include courses in economic statistics. Mr. Smart.

Price and production indexes. Analysis of time series. Linear correlation applied to economic and business problems. The application of tabulating and other mechanical equipment to statistical problems will receive some attention.

615. Industrial Statistics. Three credit hours. Spring Quarter. General prerequisites must include courses in economic statistics.

The application of statistical methods to the design and analysis of experiments with a view to planning, organizing and controlling the output of industry.

621. Business Law: Contracts. Three credit hours. One Quarter. Autumn, Winter, Spring. Mr. Power, Mr. C. W. Bowers, Mr. Ley.

A course in the law of contracts for the student of business, including the study of the fundamentals of legally binding agreements between persons, and their enforcement.

Given in the Summer of 1943.

622. Business Law for Engineers and Architects. Three credit hours. One Quarter. Autumn, Winter, Spring. Mr. C. W. Bowers, Mr. Ley.

A course in the law of contracts with special reference to engineering and architectural problems and with incidental reference to certain other phases of the law that most closely affect the engineer and architect.

Given in the Summer of 1943.

623. Business Law: Agency, Sales, Property. Three credit hours. One Quarter. Autumn, Winter, Spring. General prerequisites must include Business Organization 621. Mr. Pike, Mr. Ley.

A study of selected, fundamental principles in the subjects named, deemed important to the student of business.

Given in the Summer of 1943.

625. Business Law: Negotiable Instruments. Three credit hours. One Quarter. Autumn, Winter, Spring. General prerequisites must include Business Organization 621. Mr. C. W. Bowers, Mr. Donaldson.

A course in the laws governing bills of exchange, promissory notes and checks designed to guide the business man in his daily transactions with such instruments.

Given in the Summer of 1943.

627. Business Law: Partnerships and Corporations. Three credit hours. One Quarter. Autumn, Winter, Spring. General prerequisites must include Business Organization 621. Mr. Pike.

A course designed to give the student of business a practical working knowledge of important laws governing the formation and operation of partnerships and corporations.

Given in the Summer of 1943.

633. Governmental Agencies and Business. Three credit hours. Winter Quarter. Three meetings each week. Mr. Power, Mr. Ley.

A study of the various administrative agencies created by the local, state, and federal governments for the regulation of business from the viewpoint of the student of business. Particular consideration is given to the organization, jurisdiction and procedure of such administrative agencies and their relations to business.

635. Business Policy. Five credit hours. One Quarter. Autumn, Winter, Spring. Five class meetings each week. General prerequisites must include a course in intermediate accounting, a course in money and banking, a course in elementary economic statistics, Business Organization 650, 680, and 700, and in addition the approval of a college committee which supervises this course.

The approach of this course is that of the chief administrative officers of a business enterprise. The course deals with such topics as the functions of administration; the contributions of accounting, finance, production, management, marketing, statistics, etc., to the solution of managerial problems; the evaluation and control of business risks; the establishment and supervision of departmental plans; and the development of public relations.

640. Corporate Organization and Control. Three credit hours. One Quarter. Autumn, Winter, Spring. Three class meetings each week. Mr. Donaldson.

Types of business enterprise; the corporation; rights, duties, obligations, and liabilities of stockholders, directors, and officers.

642. Real Estate Principles. Three credit hours. One Quarter. Autumn and Spring. Three class meetings each week. Mr. Hoagland.

Principles of real property ownership and real estate practice; types of deeds, leases, restrictions; real estate brokerage, selling, advertising; property management; subdividing and developing; zoning and its effects.

643. Real Estate Finance. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include Business Organization 642. Mr. Hoagland.

Methods available for financing the ownership or occupancy of real property. Real estate and real estate paper as a field of investment. Problems involved in appraisal and practical methods of appraisal.

644. Real Estate Problems. One to three credit hours. One Quarter. Autumn, Winter, Spring. Permission of instructor must be obtained. Mr. Hoagland.

Individual research in the field of real estate, designed for students primarily interested in real estate investments and in possibilities of the real estate business.

645. Trade Associations. Three credit hours. Winter Quarter. Three class meetings each week. Mr. Hoagland, Mr. Duffus.

The nature and function of trade associations, and their relation to business and to government.

650. Corporation Finance. Five credit hours One Quarter. Autumn, Winter, Spring. Five class meetings each week. Mr. Duffus, Mr. Donaldson, Mr. Riddle, Mr. Kimball, Mr. Hoagland.

Financial structure and problems of modern business corporations.

Not open to students who have credit for or who are taking Economics 616.

Given in the Summer of 1943.

652. Industrial Finance. Three credit hours. One Quarter. Autumn and Spring. Three class meetings each week. General prerequisites must include Business Organization 650. Mr. Hoagland, Mr. Kimball.

A study of specific cases which involve the financial policies and operations of industrial companies.

653. Industrial Consolidations and Mergers. Three credit hours. Autumn Quarter. Three class meetings each week. General prerequisites must include Business Organization 640 or 650. Mr. Hoagland.

Historical and analytical study of industrial consolidations and mergers.

655. Principles of Investment. Three credit hours. One Quarter. Autumn and Spring. Three class meetings each week. General prerequisites must include Economics 616 or Business Organization 650. Mr. Hoagland, Mr. Donaldson.

Functions of investment; economic basis of investment; basic elements of investment; investment programs; problems of personal finance; field of investment. All these topics are considered from the point of view of the investor.

Not open to students who have credit for Business Organization 658.

656. Railroad and Public Utility Finance. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include Business Organization 650. Mr. Duffus, Mr. Riddle.

Financial problems peculiar to public service industries. American railroads and utilities as fields for investment and speculation and their financial administration under state and federal regulation.

657. Investment Analysis. Three credit hours. Winter Quarter. Three meetings each week. General prerequisites must include Business Organization 650. Mr. Riddle.

Principles and procedure of investment analysis; principles and technique of selecting corporation and government bonds, real estate obligations, and common stocks; the interpretation of financial factors; investments and business conditions; practical applications.

659. Investment Banking. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include Business Organization 650. Mr. Riddle.

Principles of long-period banking credit; process of investment banking; functions and operations of investment banking institutions; trends and problems of investment banking.

660. The Stock Market. Three credit hours. One Quarter. Autumn and Spring. Three class meetings each week. General prerequisites must include Business Organization 650 and a course in money and banking. Mr. Dice, Mr. Donaldson.

The New York Stock Exchange; brokerage houses, methods of trading; business cycles and movements of stock prices; regulation of stock issue and manipulation.

Given in the Summer of 1943.

662. The Money Market. Three credit hours. Spring Quarter. General prerequisites must include a course in money and banking. Mr. Dice.

New York as a money market; the acceptance and commercial paper; brokers' loans; business loans; interest and discount rates; control of the supply of money through the Federal Reserve System; present problems and trends.

665. Foreign Exchange. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include a course in money and banking.

A study of the theory and practices of foreign exchange from the standpoint of both bankers and foreign traders. The relationship of foreign exchange to international trade and financial problems is included.

666. Practice Work in Banking. One to three hours each Quarter with total credit not to exceed six credit hours. Autumn, Winter, Spring. Students are admitted on the suggestion of the instructor in charge of cooperation with the banks concerned. Mr. Dice.

Students do actual work in a bank. Each student will attend conferences in regard to his work and make reports based on the different bank operations.

670. Bank Organization and Management. One to three credit hours. Winter Quarter. General prerequisites must include a course in money and banking and Business Organization 650. Mr. Dice.

This course deals with the organization and practical operation of banks; their relations to the Federal Reserve System; government control; trends and required reforms.

674. Savings and Trust Institutions. Three credit hours. Autumn Quarter. Three class meetings each week. Given in alternate years. General prerequisites must include a course in money and banking.

The practical operations and economic significance of the building and loan associations, savings banks, trust companies, and various other institutions are studied.

680. Industrial Organization and Management. Five credit hours. One Quarter. Autumn, Winter, Spring. Five class meetings each week. Mr. Davis, Mr. Nolen, Mr. Jucius.

An examination of the basic fundamentals of management underlying the solution of problems of organization and operation in all business enterprise, followed by their application to such specific fields of industrial management as production, materials, personnel, etc.

Given in the Summer of 1943.

682. Supervisory Management. Three credit hours. Winter Quarter. General prerequisites must include Business Organization 680. Mr. Davis, Mr. Jucius.

The work of operative management within the modern factory, with particular reference to the responsibilities of the shop department head. A consideration of various phases of industrial management from his viewpoint. A critical examination of his problems, such as the intra-departmental control of production progress, maintenance of quality, training of employees, handling of grievances, correct disciplinary procedures, morale maintenance, and others, in the light of accepted management principles.

Given in the Summer of 1943.

684. Industrial Management Field Work. Three to six credit hours. One Quarter. Autumn, Winter, Spring. General prerequisites must include Business Organization 680. Mr. Davis, Mr. Jucius.

The student is expected to obtain full-time employment with an approved industrial concern. He is required to investigate and report on certain management problems of the concern. The requirements of the course can not be met while in residence at the University. The course offers an opportunity to observe the application of management principles under actual operating conditions.

685. Purchasing, Stores, and Inventory Control. Three credit hours. One Quarter. Winter and Spring. Three class meetings each week. General prerequisites must include Business Organization 680. Mr. Davis, Mr. Jucius.

An examination of the objectives, principles, and methods that enter into the work of managing the functions of supply in industry. Considers various problems including those relating to the planning of materials requirements, purchasing, receiving, storing and disbursing.

686. Personnel Organization and Management. Three credit hours. One Quarter. Autumn and Spring. Three class meetings each week. General prerequisites must include Business Organization 680. Mr. Davis, Mr. Nolen, Mr. Jucius.

An examination of the staff work required in planning, organizing, and controlling the personnel functions in the business organization, as well as the personnel responsibilities of the line executive. Considers various problems having to do with employment, industrial health and safety, labor relations and morale, employee education and training, and wage and salary administration.

Given in the Summer of 1943.

687. Production Organization and Management. Three credit hours. One Quarter. Autumn and Winter. Three class meetings each week. General prerequisites must include Business Organization 680. Mr. Davis, Mr. Jucius.

An examination of the general staff functions of production control and its relations with the line organization of the manufacturing division; the coordination of production with sales and finance; the coordination of various technical staff services with the requirements of the line function of production; routine planning, scheduling, and other control functions as they enter into interdepartmental coordination within the line organization.

Given in the Summer of 1943.

688. Work Standards and Labor Compensation. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include Business Organization 680. Mr. Davis.

A critical examination of policy, functionalization, organization morale, business procedure, standardization, and other fundamental concepts in business organization and operation, as they enter into the practical determination of good working conditions, a fair day's work, and good wages.

689. Retail Personnel Organization and Management. Three credit hours. Winter Quarter. General prerequisites must include Business Organization 680 and 700. Mr. Davis, Mr. Jucius.

This course examines the personnel management problems of executives in modern retail business. It considers management's responsibilities for an effective and proper use of its human resources, and the methods that it uses in analyzing its personnel problems, as well as the techniques employed in selecting, training, transferring, promoting, and dismissing members of the organization, controlling wage and salary adjustments, handling grievances, and performing other personnel duties.

691. Office Organization and Management. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include Business Organization 680. Mr. Davis, Mr. Jucius.

The planning, organizing, and controlling of office work. Problems of office standards, business forms and their design, the selection of business machines, the analysis of office methods.

700. Marketing. Five credit hours. One Quarter. Autumn, Winter, Spring. Five class meetings each week. Mr. Beckman, Mr. Cordell, Mr. Maynard, Mr. Burley, Mr. Nolen.

A general but critical survey of the field of marketing. Consumer demand in relation to the marketing machinery. Functions, methods, policies, marketing costs, and problems of the farmer, manufacturer, wholesaler, commission merchant, broker, retailer and other middlemen. Emphasis on principles, trends, and policies in relation to marketing efficiency.

Given in the Summer of 1943.

703. Business Research. Three credit hours. Autumn Quarter. Two lectures and one two-hour laboratory period each week. General prerequisites must include Business Organization 650, 680, and 700, a course in elementary economic statistics, and permission of the instructor. Mr. Burley, Mr. Kellogg.

Business research treated from the viewpoint of the business executive. The course deals with the discovery and utilization of existing information realting to problems of analysis other than accounting. It also includes a study of the fundamentals of primary data research, sampling, and schedule construction. Machine techniques used in the tabulation and analysis of data will be available through the Bureau of Business Research.

Not open to students who have credit for Business Organization 702.

704. Problems in Marketing Research. Three credit hours. Winter Quarter. Two lectures and one two-hour laboratory period each week. General prerequisites must include Business Organization 702 or 703. Mr. Burley, Mr. Kellogg.

Problems in marketing research are studied as a basis for the development of market organizations, and the formulation of policies and plans. Field work, including schedule construction, sampling, field testing, editing, tabulation, and analysis as applied to a specific marketing problem. Students will use electrical tabulating equipment in the analysis of their field project data.

705. Retail Merchandising. Four credit hours. One Quarter. Autumn, Winter, Spring. Four class meetings each week. General prerequisites must include Business Organization 700 and elementary courses in accounting. Mr. Maynard, Mr. Dameron.

A consideration of the organization and management of retail establishments: store location; store organization; buying; receiving; stockkeeping; inventories; sales systems; store policies; services; expenses and profits; deliveries; personnel problems, etc.

Given in the Summer of 1943.

706. Wholesaling. Four credit hours. One Quarter. Autumn and Spring. Four class meetings each week. General prerequisites must include Business Organization 700 and elementary courses in accounting. Mr. Beckman.

The field of wholesaling; types and classes of wholesale organizations; tendencies in wholesaling; wholesale centers. Organization and management of wholesale establishments including

location, purchasing, receiving, stock control, advertising, selling, order filling, traffic management, credit granting, expenses, profits, etc.

709. Credits and Collections. Four credit hours. One Quarter. Autumn, Winter, Spring. Four class meetings each week. General prerequisites must include Business Organization 700 and elementary courses in accounting. Mr. Beckman, Mr. Cordell.

Credit—nature, functions, instruments, classes, risk, organization and management. Sources of credit information. Collection methods and policies. Extensions, compositions, adjustments, receiverships, bankruptcy, credit insurance, credit limits, credit and collection control.

Given in the Summer of 1943.

710. Advanced Credit Problems. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include Business Organization 709. Mr. Beckman.

A course designed for students interested in mercantile or retail credit and in credit management as a career. Readings, cases, and problems. Emphasis on credit analysis and on term reports covering individual research of subjects chosen from the standpoint of each student's special interests.

712. Sales Management. Four credit hours. One Quarter. Autumn, Winter, Spring. Four class meetings each week. General prerequisites must include Business Organization 700. Mr. Maynard, Mr. Nolen.

This course deals with the functions of the sales manager. Principal topics considered are: Sales organization; planning, quotas and territories; selecting, training, and compensating salesmen; stimulation and supervision; and the use of cost data as a guide to the formulation of sales policies.

713. Salesmanship. Two or three credit hours. One Quarter. Autumn and Spring. General prerequisites must include Business Organization Organization 700. Mr. Maynard, Mr. Nolen.

Effective selling technique. The psychological, economic, and marketing foundations of the sales activities which are the basis of the daily work of the salesman. The material considered is designed to be of value to students throughout the University as well as those majoring in marketing or commercial education.

Given in the Summer of 1943.

715. The Consumer in Our Marketing System. Three credit hours. Spring Quarter. Three class meetings each week. Mr. Beckman, Mr. Burley.

The entire marketing system considered from the viewpoint of the consumer; the consumer movement; consumer attitudes toward marketing institutions, advertising, salesmanship, and standardization programs; marketing and credit practices, policies and institutions, including consumers' cooperatives, which affect the consumer; and government aid and protection to the consumer.

716. Principles of Advertising. Four credit hours. One Quarter. Autumn, Winter, Spring. Four class meetings each week. General prerequisites must include Business Organization 700 also elementary courses in psychology. Mr. Dameron, Mr. Cordell.

A general course in advertising which considers the use of advertising and sales promotion in the sale of goods and services. Advertising agencies. Advertising departments. Copy, layout, illustrations, typography, engraving. Advertising media. Radio advertising. Advertising research. National advertising campaigns. Economics of advertising.

717. Advertising Practice. Three credit hours. Winter Quarter. Two class meetings and one two-hour laboratory period each week. General prerequisites must include Business Organization 716. Mr. Dameron.

The technique of advertising with emphasis on copy and layout. Consumer and trade advertising in general markets. Advertising production. Advertising technique in relation to selling problems. Preparation of radio advertising programs and technique of commercial announcements.

Laboratory assignments based upon practical advertising problems.

719. Retail Advertising and Sales Promotion. Four credit hours. Spring Quarter. Two class meetings and one two-hour laboratory period each week.

General prerequisites must include Business Organization 717 or the permission of the instructor. Mr. Dameron.

Advertising department of a retail store. Importance of newspaper advertising to retailer. Use of radio advertising by retailer. Window displays. Inside the store promotions. Direct mail. Sales promotion. Advertising and sales promotion budgets. Advertising plans. Coordination of selling effort.

Laboratory problems based upon actual store promotions.

720-721. Exporting and Importing. Three credit hours. Two Quarters. 720, Autumn; 721, Winter. Three class meetings each week. Preferably preceded or accompanied by Business Organization 700, and a course in money and banking. Mr. Held.

Methods of conducting export and import business; foreign trade correspondence and advertising; market analysis; export commission houses and other sales agencies; handling shipments; credits and collections.

725. Field Work in Marketing. Three to six credit hours. One Quarter. Autumn, Winter, Spring. General prerequisites must include Business Organization 700. Mr. Maynard, Mr. Beckman.

This course is open to students temporarily not in residence. The student is required to submit a report covering certain of the marketing problems of the company by which he had been engaged.

Given in the Summer of 1943.

740. Public Utility Organization and Administration. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include Economics 618 or 648. Mr. Power.

Public utilities as business enterprises; problems of organization, regulation, and business management in the gas, electric, water, transportation, telephone, telegraph, radio communication, and other utility industries.

751. Motor Carrier Organization and Administration. Three credit hours. Spring Quarter. Three class meetings each week. Given in alternate years. General prerequisites must include Economics 618 or 648 or Business Organization 680. Mr. Duffus, Mr. Power.

Highway transportation of persons and property by motor vehicles as a business enterprise; organization and administration of the different types and classifications of motor carriers; current problems confronting their management in their relations with travelers, shippers, competing transportation agencies, and administrative law.

752. Traffic Management. Four credit hours. Winter Quarter. Four class meetings each week. General prerequisites must include one of the following: Economics 618, 648, Business Organization 680, or must be taken concurrently. Mr. Duffus.

Traffic management as a factor in business enterprise. Analysis of the business relationships between shippers and carriers with respect to rates and services in the transportation of goods by rail, highway, water, pipe line, and air. Organization of traffic management by shippers and carriers.

755. Air Transport Management. Three credit hours. Autumn Quarter. Three class meetings each week. General prerequisites must include Economics 619.

Major problems of business management in this industry. Financing the industry. Types of airports and problems of their operation. Choice of and routing of equipment. Functions and management of the operations department. Air mail, express and freight services. Rate making. Insurance practice. Personnel and other labor relationships—Public relations.

756. Air Traffic Sales Management. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include Business Organization 755.

The organization and operation of the traffic department of air transport organizations. The advertising, selling, and sales management functions of business as applied to the problems and operations peculiar to this industry.

759. Air Law. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include Business Organization 755.

A study of state and federal regulation of air carriers. Consideration is given to safety

measures, including registration and licensing of aircraft and pilots and establishment of air traffic rules. An examination of the regulations dealing with service, rates and financing, and of the various regulatory commissions, including the Civil Aeronautics Authority, Air Rights. The law of common carriers.

760. Personal Insurance. Three credit hours. Winter Quarter. Three class meetings each week. Mr. E. L. Bowers.

Life insurance; accident and health insurance; annuities. Premiums; reserves; investments; surrender values; dividends, etc. Types of policies and companies. Adaptation of insurance to individual cases. Agency organization; state supervision.

761. Casualty Insurance and Surety Bonding. Three credit hours. Spring Quarter. Three class meetings each week. Mr. Ley.

A study, in part, of the following types of insurance and bond coverages: automobile collision; public liability and property damage, including automobile; burglary and robbery; sprinkler leakage and water damage; public officials, court, fiduciary, contract, and depository bonds; title insurance and credit insurance. An examination of the types of insurance and bonding companies and of the extent of governmental supervision and regulation thereof.

764. Fire and Marine Insurance. Three credit hours. Winter Quarter. Three class meetings each week. Mr. Ley.

Detailed examination of fire, ocean and inland marine insurance contracts. A study of consequential fire coverages including use and occupancy, rent, rental value, and leasehold insurance; inspection and rate making, and adjustment. Types of insurance companies and governmental supervision and regulation thereof.

799. Special Problems in Business Organization. One to three credit hours. One Quarted. Autumn, Winter, Spring. Permission of the instructor is required.

Individual investigations of specific problems in the following fields of Business Organization:

a. Corporation Organization and Finance. Mr. Hoagland and others.
b. Real Estate Problems. Mr. Hoagland and others.
c. Insurance. Mr. E. L. Bowers and others.
d. Marketing. Mr. Maynard and others.
e. Banking. Mr. Dice and others.
f. Industrial Management. Mr. Davis and others.
g. Transportation and Public Utilities. Mr. Duffus, Mr. Power.
h. Radio Advertising. Mr. Dameron.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

804. Corporation Finance for Graduate Students. Three credit hours. One Quarter. Winter and Spring. Mr. Hoagland, Mr. Donaldson.

A conference course for graduate students. The content for any particular Quarter will be adapted to the needs of the students enrolled for that Quarter and will be announced in advance.

Given in the Summer of 1943.

816-817-818. Advanced Marketing for Graduate Students. Three credit hours. Autumn, Winter, and Spring Quarters. Three class meetings each week. General prerequisites must include Business Organization 700. Mr. Maynard, Mr. Beckman, Mr. Dameron, Mr. Nolen, Mr. Burley.

The first two Quarters deal with the evolution of marketing institutions and ideas, early literature in the field, and a critical consideration of fundamental principles of marketing. Special emphasis on the historical and theoretical approach.

The work of the third Quarter is devoted to a consideration of selected marketing problems. Problems chosen will depend upon their contemporary significance and the needs of students enrolled in the course.

Business Organization 816 given in the Summer of 1943.

820. Problems of Banking and of Stock Prices. One to three credit hours. Spring Quarter. Mr. Dice.

A seminar in the leading problems relating to banking and to stock prices. The desires of the group will determine whether the major part of the course shall be devoted to problems of banking or to problems involved in determining the movements of stock prices.

827. Stock Market for Graduate Students. Three credit hours. Autumn Quarter. Mr. Dice.

A study of the problems involved in judging stock values.

***829. Advanced Personal Insurance.** Three credit hours. Spring Quarter. Given in alternate years. Mr. E. L. Bowers.

A critical analysis of special problems in the field of life, accident, health and old age insurance. A study of personal insurance programing.

830. Advanced Property Insurance. Three credit hours. Spring Quarter. Given in alternate years. Mr. Ley.

A critical analysis of special problems in the field of fire and casualty insurance. A study of the newer types of fire and casualty insurance.

831. Graduate Seminar in Business Organization for Beginning Graduate Students. Two credit hours. Winter Quarter. Mr. Burley.

833. The Theory of Organization and Operation. Three credit hours. Autumn Quarter. General prerequisites must include Business Organization 680. Mr. Davis, Mr. Jucius.

An examination of the following factors as they enter into the problems of planning, organizing and controlling business activities: Business objectives, business ideals, executive leadership, business plans and planning, business policy, functions and functionalization, physical factors of environment. The point of view is that of the administrative executive.

Business Organization 833a given in the Summer of 1943.

834. The Theory of Organization and Operation. Three credit hours. Winter Quarter. General prerequisites must include Business Organization 680. Mr. Davis.

An examination of the following factors as they enter into the problem of planning, organizing and controlling business activities: Responsibility, authority, accountability, organization structure, line organization, staff organization, completely functionalized relationships, committee organization, organization specifications. The point of view is that of the administrative executive.

Given in the Summer of 1943.

845. Transportation and Public Utilities for Graduate Students. Three credit hours. One Quarter. Autumn and Winter. Mr. Duffus, Mr. Power.

A conference course for graduate students. The content for any particular Quarter will be adapted to the needs of the students enrolled for that Quarter and will be announced in advance.

950. Research in Business Organization. Autumn, Winter, and Spring Quarters.

Individual investigations, group discussions participated in by those investigating related subjects. The following fields are suggested:

(a) Corporation Organization and Finance. Mr. Hoagland, Mr. Duffus, Mr. Riddle, Mr. Donaldson.
(b) Real Estate Problems. Mr. Hoagland.
(c) Insurance. Mr. E. L. Bowers, Mr. Ley.
(d) Marketing. Mr. Maynard, Mr. Cordell, Mr. Dameron, Mr. Burley, Mr. Nolen.
(e) Banking. Mr. Dice.
(f) Industrial Management. Mr. Davis, Mr. Jucius.
(g) Transportation and Public Utilities. Mr. Duffus, Mr. Power.

Given in the Summer of 1943.

* Not given in 1943-1944.

CERAMIC ENGINEERING
Office, 131 Lord Hall

PROFESSORS WATTS, CARRUTHERS, AND BOLE (RESEARCH), ASSOCIATE PROFESSOR KING

The following courses do not carry credit for students who received the degree of Bachelor of Ceramic Engineering from The Ohio State University: 600, 601, 603, 605, 610, 615, 620, 705, 706, 707, 708. Courses 701, 702, and 703 may be taken in two different fields and only one of these fields is required for the Bachelor's degree. Graduate students may therefore receive credit for these courses in the fields which did not count towards the Bachelor's degree.

These prerequisites must include satisfactory training in qualitative and quantitative analysis, a knowledge of the general principles of ceramic technology, a knowledge of mathematics through calculus and analytical mechanics, at least a one year's course in physics, with laboratory and problem work, and engineering drawing.

Prerequisites for Graduate Work: Students having a degree in ceramic engineering or technology from an accredited college or university and who have a point average of not less than 2.5 in their undergraduate work and 2.7 in their graduate work may be admitted to graduate study in the Department of Ceramic Engineering subject only to arrangement with adviser or faculty committee.

Students not having a degree as noted above should have a degree covering a major in one and minors in one or more of the physical sciences and should have point averages as indicated above.

Candidates for advanced degrees are required to have credit for courses in qualitative and quantitative analysis, physical chemistry, thermochemical mineralogy, mathematics through calculus including analytical mechanics and at least one year's work in physics with laboratory and one year's work in engineering drawing. The prerequisites for graduate work in ceramic engineering and technology are represented by departmental courses 401, 600, 601, 610, 615, and 620. With approval of adviser these requirements may be met by passing comprehensive examinations with the exception of Ceramic Engineering 620.

Applicants who wish to pursue graduate work in ceramic engineering and who have had special and successful experience may be given special consideration as to point average and other requirements.

Fields of Study: Fields of study may be classified broadly as ceramic engineering and ceramic technology, and research under this classification may be pursued in the following specific fields: abrasives, vitreous enamels, glass, structural clay products, refractories, terra cotta, whiteware (electrical porcelain, sanitary ware, and dinnerware), and technical design of ceramic equipment.

Requirements of the Ph.D. Degree: To obtain the degree of Doctor of Philosophy in ceramic engineering students are required to have credit for at least fifteen hours in approved 700 courses of the department in addition to requirements for the Master's degree and the regular requirements of the Graduate School.

Departmental Committee on Graduate Work: The three members of the department instructional staff will act as a committee, in cooperation with the Enrance Board and Graduate School, in passing on special cases.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

600. Theory of Drying. Three credit hours. Autumn Quarter. Three lectures each week. General prerequisites must include two Quarters of college physics. Mr. Carruthers.

A study of the fundamental physical laws and ceramic technology involved in drying ceramic wares and their application to commercial practice.

601. Driers, Kilns, and Theory of Firing. Five credit hours. Winter Quarter. Five lectures each week. General prerequisites must include Ceramic Engineering 600. Mr. Carruthers.

A study of the fundamental principles involved in firing ceramic wares, their application in various ceramic processes and the various types of driers and kilns used in ceramic plants.

603. Elements of Ceramic Plant Engineering. Five credit hours. Winter Quarter. Five lectures each week. General prerequisites must include Ceramic Engineering 600. Mr. Carruthers.

A study of the basic processes and equipment used in ceramic manufacturing, including grinding, sizing, filtration, draft, heat transfer, and extrusion.

605. Bodies, Glazes, and Colors. Four credit hours. Spring Quarter. Four lectures each week. General prerequisites must include Ceramic Engineering 615. Mr. Watts.

Ceramic bodies, glazes, and colors.

610. Refractories and Their Uses. Five credit hours. Spring Quarter. Five lectures each week. Mr. King.

Lectures on refractories, their physical and chemical compositions and properties, their utilization and testing.

615. Ceramic Calculations. Five credit hours. Autumn Quarter. Five recitations each week. General prerequisites must include courses in ceramic analysis. Mr. King.

Solution of chemical and physical problems involved in compounding ceramic mixtures, including wet blending. Also instruction in development of series, containing one, two, and three variables.

620. Physical and Chemical Measurements of Clays and Other Ceramic Materials. Five credit hours. Winter Quarter. Two recitations and eight laboratory hours each week. General prerequisites must include Ceramic Engineering 615 and Chemistry 680. Mr. King.

Application of physical chemical laws to ceramic materials and compounds. Laboratory practice in determination of the essential physical and chemical properties of ceramic mixtures and compounds in the plastic, dry, vitrified, and fused states.

701. Ceramic Investigations. Five credit hours. Autumn Quarter. Conference, library, and laboratory work. General prerequisites must include Ceramic Engineering 605, 615, and 620. Mr. Watts, Mr. King.

Detailed studies and definite problems having practical application in one or more of the following fields of ceramic technology: (a) stoneware; (b) terra cotta; (c) saggers; (d) metal enamels.

702. Ceramic Investigations. Five credit hours. Winter Quarter. Conference, library, and laboratory work. Mr. Watts, Mr. King.

Detailed studies and definite problems having application in either of the following fields of ceramic technology: (a) earthenware, china, and porcelains; (b) structural clay products.

703. Ceramic Investigations. Five credit hours. Spring Quarter. Conference, library, and laboratory work. Mr. Watts, Mr. King.

Detailed studies and definite problems in practical applications in either of the following fields of ceramic technology: (a) glazes and colors; (b) refractories.

705. Ceramic Designing. Five credit hours. Autumn Quarter. One lecture, one quiz, and eight laboratory hours each week. General prerequisites must include Ceramic Engineering 601 and Mechanics 602. Mr. Carruthers.

Designing of clay plant structures and equipment such as buildings, bins, and retaining walls. Practical problems in structural design and storage of clays.

706. Ceramic Designing. Five credit hours. Winter Quarter. One lecture, one quiz, and eight laboratory hours each week. General prerequisites must include Ceramic Engineering 705. Mr. Carruthers.

A continuation of Ceramic Engineering 705. Study of drying and fan problems and the design of driers.

707. Ceramic Designing. Five credit hours. Spring Quarter. One lecture, one quiz, and eight laboratory hours each week. General prerequisites must include Ceramic Engineering 706. Mr. Carruthers.

A continuation of Ceramic Engineering 706. Study of firing and factory equipment problems and design of kilns and complete clay plants.

708. Technology of Glass. Three credit hours. Autumn Quarter. Two lectures and three laboratory hours each week. General prerequisites must include Ceramic Engineering 615. Mr. Watts.

Practice in melting typical glass batches. Studying physical behavior during the melting process and in the molten state. Measurement of some of the physical properties of the glass produced experimentally and of commercial glasses.

750. Special Problems. Two to seven credit hours. Autumn, Winter, and Spring Quarters. Conference, library, and laboratory work. General prerequisites must include fundamental ceramic engineering courses. Consent of department is required. This course may be repeated for different problems or continuation of original problem, with total credit not to exceed fifteen hours. All instructors.

This course is designed to permit any properly qualified student to avail himself of the library and laboratory facilities of the department for carrying on a special investigation or for adding to his knowledge and technique in some ceramic subject.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

810-811-812. Porcelain for Electrical and Other Special Purposes. Two credit hours. Autumn, Winter, and Spring Quarters. Mr. Watts.

Ceramic Engineering 810 given in the Summer of 1943.

815. Seminar in Ceramic Engineering. One to five credit hours. Autumn, Winter, and Spring Quarters. Mr. Watts, Mr. Bole, Mr. Carruthers, Mr. King.

The course consists of conference and reports on problems in ceramic technology and engineering. Topics are chosen to cover the development of the ceramic industry.

Given in the Summer of 1943.

950. Research in Ceramic Engineering. Autumn, Winter, and Spring Quarters. Permission of the instructor must be obtained.

Research in ceramic technology and engineering, in analytical and physical chemistry of ceramic materials and mixtures, in mineralogy and geology of ceramic deposits, in physical and chemical testing of ceramic materials and products, under Mr. Watts, Mr. Bole, or Mr. King; in the engineering, designing and testing of ceramic apparatus processes and structures, under Mr. Carruthers; in ceramic whitewares, under Mr. Watts; in refractories and metal enamels under Mr. King. The student may spend a part or all of his time on research work.

Given in the Summer of 1943.

CHEMICAL ENGINEERING

Offices, 179, 180 Chemistry Building

PROFESSORS WITHROW AND KOFFOLT, ASSISTANT PROFESSOR HERNDON, MR. PENCE

Prerequisites for Graduate Work: The student must have had undergraduate training in chemical engineering in an accredited school or, if from an unaccredited school, in chemical engineering or in chemistry or in engineering provided in the latter cases he has had mathematics through calculus (an additional course in differential equations is desirable), two years chemistry including quantitative analysis (organic and physical chemistry desirable), and one year college physics. Desirable also are an introduction to mineralogy and engineering drawing.

Areas of Specialization: Graduate work in the department is designed with the idea of preparing the student for work in the field of chemical engineering, in related fields of industrial chemistry and applied electrochemistry, each of these two latter fields having a quite different undergraduate and graduate approach requiring flexibility in background and foundation. The regular chemical engineering approach is more rigorous and can be arranged by electives and petitions to include the other fields and thus meet the highly diversified opportunities of industry without requiring curricula in preparation for chemical and related industry. It is expected that those with the strictly chemical bavkground will prepare for work in industrial chemistry, but the curriculum may be arranged to take some of the chemical engineering work. It is expected that all graduate students will have had or will take certain of the basic courses in the department.

Departmental Examinations: Not later than the middle of the Quarter before a student expects to become a candidate for the Master's degree or the Quarter before he expects to take the general examination for the Doctor's degree, he must pass a series of written examinations covering the fundamental work in chemistry, industrial chemistry, and chemical engineering.

The general comprehensive examination for the Master's degree is both oral and written, but the latter part may be waived by the Departmental Committee on Graduate Work if the final writeup of the thesis has met all written criticism in an adequate manner.

Departmental Committee on Graduate Work: A committee, including the Chairman of the Department, acts in an advisory capacity for graduate students and is in charge of the administration of the regulations of the Department.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

691. Elements of Chemical Engineering. Two credit hours. Autumn Quarter. Two lecture-recitation periods each week. Physical chemistry must be included in the general prerequisites or taken concurrently, except with special permission of the instructor. Mr. Koffolt.

A thorough discussion of the engineering operations utilized in the chemical branch of engineering with emphasis on the engineering requirements of the market and economics and of the process and their effect on the engineering used. The work of the course is confined to the fundamental chemical engineering operations as fluid flow, heat transfer, and those operations largely utilized where solids are concerned such as crushing, screening, etc., and is directed toward a study of the fundamental principles involved, the engineering equipment available and by means of numerous computational problems, the application of science and mathematics.

692. Elements of Chemical Engineering. Two credit hours. Winter Quarter. Two lecture-recitation periods each week. Physical chemistry must be included in the general prerequisites or taken concurrently, except with special permission of the instructor. Mr. Pence.

A continuation of the study of engineering operations constituting the body of Chemical Engineering concerned with those operations largely utilized where liquids and gases are concerned, such as evaporation, distillation, drying, liquefaction, absorption, etc. Examples of special design requirements for processes such as carbonization, nitration, sulfonation, etc., as well as catalytic processes are studied with respect to the principles involved and the engineering equipment developed to carry out these processes. Emphasis is placed upon the concept of separations, such as the engineering requirement of the separation of solids from solids, from liquids, from gases, liquids from solids, from liquids, etc.

Given in the Summer of 1943.

693. Problem in Chemical Engineering Operations. Two to eight credit hours. One Quarter. Autumn, Winter, Spring. Conference, library, and laboratory work. Chemical Engineering 691 and 692 must be included in the general prerequisites or taken concurrently. This course may be repeated on other problems as desired. Mr. Koffolt, Mr. Pence, Mr. Withrow, Mr. Beidler.

This course consists of individual or group conferences, library, and laboratory work dealing with the fundamental chemical engineering operations. The work of the course stresses quantitative treatment of the application of physics, mathematics, and chemistry in the field of Chemical Engineering.

Not open to students who have credit for Chemical Engineering 694.

Elective for students in the Colleges of Arts and Education and in the Graduate School.

Given in the Summer of 1943.

694. Chemical Engineering Operations Laboratory. Eight credit hours. General prerequisites must include Chemical Engineering 691 and 692. Mr. Koffolt, Mr. Withrow, Mr. Herndon, Mr. Machwart.

The fundamental laboratory course in chemical engineering concurrent with a series of lecture conferences and problems on the theory of chemical engineering operations. Laboratory study and investigation of the operating characteristics and efficiency of equipment utilized in carrying out the more important chemical engineering operations, such as fluid flow, heat transfer, distillation, etc. Stress is laid upon the practical utilization of calculus, physics, physical chemistry, and thermodynamics, and the construction and use of graphical charts and representations, such as nomographs, graphical calculus, etc.

Given in the Summer of 1943.

701-702. Industrial Chemistry. Three credit hours. Autumn and Winter Quarters. Three lectures each week. Physical chemistry must be included in the general prerequisites or taken concurrently, except with special permission of the instructor. Mr. Withrow, Mr. Pence.

The fundamental lecture course in the problems of industrial chemistry or chemical technology, dealing with the problems of the chemical industries, and stressing comprehensive and detailed computational treatment involving the applications of the fundamentals of economics, mathematics, physics, chemistry, chemical engineering, etc., to the solution of problems involving integration in part or in detail of sequences of chemical and engineering operations which make up processes. The work of the Autumn Quarter deals especially with the inorganic industries, while that of the Winter Quarter is related to the organic industries.

Chemical Engineering 702 given in the Summer of 1943.

*703. **Inspection Trip to the East.** No credit hours. One week between the Winter and Spring Quarters, 1945, and odd-numbered years thereafter. In addition to the general prerequisites, permission of the instructor is required. Mr. Withrow, Mr. Koffolt.

The trip includes Rittman, Akron, and Cleveland, Ohio; Niagara Falls, Rochester, and New York, New York; Grasselli and Deep Water Point, New Jersey, Wilmington, Baltimore, and Curtis Bay, Maryland; and Washington, D. C. The entire expense need not exceed $70.00. A satisfactory written report upon the work of the trip is required.

704. **Inspection Trip to the West.** No credit hours. One week between the Winter and Spring Quarters, 1944, and even-numbered years thereafter. In addition to the general prerequisites, permission of the instructor is required. Mr. Withrow, Mr. Koffolt.

The trip includes Dayton, West Carrollton, Hamilton, Cincinnati, and Ivorydale, Ohio; Kensington, Illinois; Grasselli and Whiting, Indiana; Chicago and Argo, Illinois; Detroit, Wyandotte, and Midland, Michigan. The entire expense need not exceed $55.00. A satisfactory written report upon the work of the trip is required.

705. **Written Reports.** No credit hours. One week between the Winter and Spring Quarters in the University Library. General prerequisites must include Chemical Engineering 701-702. Mr. Herndon, Mr. Pence.

A substitute course for Chemical Engineering 703 or 704, allowed only upon presentation of reasons satisfactory to the instructor in charge. The course consists of assigned reading designed to familiarize the student with all that can be found in the literature or plants regarding chemical engineering, and specified industrial chemical processes, together with a full written report.

706. **Chemical Engineering and Industrial Chemistry Laboratory.** Two to five credit hours. Autumn Quarter. One hour conference and five to fourteen laboratory hours each week. General prerequisites must include an acceptable course in analytical chemistry. Chemical Engineering 701 must also be included in these general prerequisites or taken concurrently. Mr. Withrow, Mr. Herndon, Mr. Koffolt, Mr. Pence.

An introduction to industrial chemical research through assigned manufacturing problems, beginning with the preliminary analysis of an inorganic, and organic production problem, progressing through the logical steps of laboratory development to the final culmination of the investigation—the design and layout of equipment of the plant to make the given chemical product. Emphasis is placed on the correlation and integration of the fundamental courses in chemistry, mathematics, chemical engineering operations, engineering drawing, etc. The specific problems are so chosen as to disclose the fundamental principles underlying the assigned industry. Weekly inspection trips are taken to plants in and around Columbus for study and report upon equipment and operation. Great emphasis is laid upon methods of attacking problems and upon organization of written and oral reports. Certain types of problems with engineering equipment and in factory research are required of all students, after which opportunity is given the student to select special problems in various portions of the fields of chemical engineering such as absorption systems, filtration, etc., and in industrial chemistry such as petroleum, sugar technology, intermediates, wood distillation, insecticides, starch, lime, chlorine, and plant fume questions.

707. **Engineering Chemistry and Chemical Engineering Laboratory.** Three credit hours. Winter Quarter. One conference and eight laboratory hours each week. General prerequisites must include Chemical Engineering 706. Chemical Engineering 702 must be taken concurrently. Mr. Herndon, Mr. Withrow, Mr. Pence.

A continuation of Chemical Engineering 706. Special emphasis is laid upon technical methods of control as applied to industrial chemical processes and upon control of technical products according to standard American Society for Testing Materials methods and with standard equipment pointing out how test underlies engineering design.

Given in the Summer of 1943.

708. **Practical Experience in Chemical Engineering Work.** Six credit hours. General prerequisites must include Chemical Engineering 691-692. Mr. Withrow.

Academic credit for this course is based on the reports of a student who has had practical

* Not given in 1943-1944.

experience of a chemical engineering character in a semi-responsible position covering a more advanced grade of work than that required in Chemical Engineering 501.

The student shall present a satisfactory report, the outline and basis of which, it is preferred, shall be arranged in conference prior to beginning the work. In general the report shall cover in very considerable detail, the particular industry with which the student is connected, in respect to market demand and economics, chemistry involved, engineering operations, plant layout, special equipment and design, operation methods, costs and efficiencies (in so far as this information is obtainable), labor problems, and safety and health hazards, together with other pertinent matter. Flow sheets, production schedules, sketches and photographs to illustrate the report, are especially to be desired.

The student also who has had twelve months' or more experience in industry may present a report which, if satisfactory, will be accepted in lieu of the above requirements.

710. Applied Electrochemistry. Three credit hours. Spring Quarter. Three lectures each week. General prerequisites must include Chemistry 681-682-683 or special permission of the instructor must be obtained. Mr. Pence.

A survey of the electrochemical industries and a discussion of the principles underlying the application of the electric current in chemical industries. Quantitative relationships and application of thermodynamics are stressed, requiring the solution of numerous problems.

712-713-714. Advanced Chemical Engineering Machinery Laboratory. Two to six credit hours. Autumn, Winter, and Spring Quarters. One conference and five to seventeen laboratory hours each week. General prerequisites must include Chemical Engineering 706-707 or special permission of the chairman of the department must be obtained. Mr. Koffolt, Mr. Withrow, Mr. Pence.

An advanced course of minor problems dealing with various chemical engineering equipment with the view of acquainting students with all types of equipment, their design, and operation. The application of thermodynamics and graphics to chemical engineering problems.

The conferences cover topics chosen from the field of chemical engineering. Specific topics are given each Quarter.

Students may repeat these courses with credit, with the approval of the chairman of the department, inasmuch as the topics vary from year to year. The following is a list of topics from which work in this course is chosen: Graphical Chemical Engineering Computations, Drying, Humidification, Dehumidification, Adsorption, Absorption, Fume and Smoke, Crystallization, Filtration, Crushing and Grinding, Furnace and Pyrometry, Evaporation, Refrigeration, Distillation, Cracking, Heat Transfer, and Flow of Fluids.

Chemical Engineering 713 given in the Summer of 1943.

723. Special Project Problem Investigations. Five or six credit hours. One Quarter. Autumn, Winter, Spring. Conferences and laboratory work. General prerequisites must include Chemical Engineering 722, except by special permission. Mr. Withrow, Mr. Koffolt, Mr. Herndon, Mr. Pence.

Individual laboratory work on some problem chosen to develop power of independent investigation, with the understanding that preliminary separate reports on both analysis and planning of experimental work undertaken will be required before experimental attack on the problems themselves, involving special attention to hazards and safety measures.

Elective for students in the Graduate School.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

801. Special Problems in Chemical Engineering and Chemical Technology. Credit hours to be arranged. Autumn, Winter, and Spring Quarters. Conference, library and laboratory work. General prerequisites must include satisfactory courses in the field of the problem undertaken. The course may be repeated on other problems as desired. Mr. Koffolt, Mr. Herndon, Mr. Withrow, Mr. Pence.

The work of the course is carried on by individual conference, library, and laboratory work and consists of problems involving application of physics, mathematics, drawing, mechanics, chemistry, economics, and general thermodynamics in the field of chemical engineering and chemical technology. This course is largely practical examinations by assigned special problems covering widely all the applications of fundamental underlying chemical engineering and chemical technology.

Given in the Summer of 1943.

900-901-902. Advanced Industrial Chemistry and Chemical Engineering. Credit hours to be arranged. Autumn, Winter, and Spring Quarters. One hour conference and five to fourteen laboratory hours each week. General prerequisites must include acceptable courses in industrial chemistry, or the permission of the instructor must be obtained. Mr. Koffolt, Mr. Herndon, Mr. Withrow, Mr. Pence.

An advanced course dealing with the solution of minor problems in industrial chemistry and chemical engineering. Special work will be planned along lines in industrial chemistry or chemical engineering as may be desired by the individual student.

Chemical Engineering 900 given in the Summer of 1943.

905-906-907. Seminar in Industrial Chemistry and Chemical Engineering. Two credit hours. Autumn, Winter, and Spring Quarters. Two conference hours each week. General prerequisites must include satisfactory courses in industrial chemistry. Mr. Withrow, Mr. Koffolt, Mr. Herndon, Mr. Pence.

The course consists of conferences and reports upon methods of attacking special problems in industrial chemistry and chemical engineering. The topics vary from Quarter to Quarter, keeping in touch with the constant development of chemical industry.

Chemical Engineering 905 given in the Summer of 1943.

950. Research in Industrial Chemistry and Chemical Engineering. Credit hours to be arranged. Autumn, Winter, and Spring Quarters. Library, conference, and laboratory work. General prerequisites must include satisfactory courses in the chosen field of research. Mr. Withrow, Mr. Koffolt, Mr. Herndon, Mr. Pence.

Advanced research problems and dissertation in any one of the following fields depending upon undergraduate approach:

a. Chemical Engineering
b. Industrial Chemistry
c. Applied Electrochemistry

Given in the Summer of 1943.

CHEMISTRY

Office, 116 Chemistry Building
General Chemistry Office, 115 Chemistry Building

PROFESSORS MACK, EVANS (EMERITUS), McPHERSON (EMERITUS), HENDERSON (EMERITUS), FOULK (EMERITUS), BOORD, FRANCE, JOHNSTON, MOYER, BRODE, WOLFROM, HENNE, AND HASKINS, ASSOCIATE PROFESSORS GARRETT AND HARRIS, NON-RESIDENT ASSOCIATE PROFESSOR ROTHEMUND (KETTERING FOUNDATION, ANTIOCH COLLEGE), ASSISTANT PROFESSORS HOLLINGSWORTH, MacNEVIN, VERHOEK, WIRTH, NEWMAN, LASSETTRE, McREYNOLDS, AND MacWOOD

Prerequisite for Graduate Work: The student must have had approximately 50 Quarter hours (33 semester hours) of undergraduate work in chemistry. This requirement must include general inorganic chemistry, qualitative and quantitative analysis, introductory courses in organic and physical chemistry, including laboratory work in all subjects.

Requirements for the Master's Degree: (a) The course requirements for the Master's degree are not rigidly fixed, but the program of work should lead to an adequate and well-rounded foundation for advanced work. These courses should be supplemented by others selected from the candidate's field of specialization and in conference with his adviser. (b) The candidate must give evidence of his ability to read chemical papers in either French or German. (c) About two weeks prior to the date proposed for conferring the degree the candidate must pass a written examination. Should the graduate record of the candidate be wholly satisfactory, the scope of the examination would be confined to the candidate's field of specialization.

Requirements for the Degree of Doctor of Philosophy: (a) The Department of Chemistry requires certain broad general courses of the graduate student during his first year. These courses include a systematic training in experimentation, a study of the thermodynamic approach to chemical problems, and advanced courses in organic, analytical and inorganic chemistry. A satisfactory performance in these general courses is required of the student who expects to undertake a research and to become a candidate for the Doctor's Degree. (b) The student should acquire such broad mastery of his chosen field in Chemistry as may be reasonably expected of a professional chemist, and such background as may be acquired from the advanced courses and seminars offered by the Department and from laboratory experience and from the chemical literature (especially current literature). For admission to candidacy the student must

pass satisfactorily an examination at a time that corresponds as nearly as possible to the beginning of his third year of graduate study. The examination will be written and oral, and will be largely limited to the student's field of specialization in Chemistry. (c) Further, the student must possess a good reading knowledge (in chemical literature) of both French and German, as determined by special examinations. (d) An acceptable dissertation and a final oral examination on the dissertation and related aspects of Chemistry are required.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

621. Advanced Quantitative Analysis. Two credit hours. Autumn Quarter. Six laboratory hours each week. General prerequisites must include previous or concurrent registration in Chemistry 622. Mr. Moyer.

An extension of the first year's work in quantitative analysis including potentiometric and conductometric titrations, colorimetric analysis and hydrogen ion determinations.

622. General Quantitative Analysis. Three credit hours. Autumn Quarter. Three lectures or recitations each week. Mr. Moyer, Mr. MacNevin, Mr. Wirth.

General principles of chemical analysis.

Given in the Summer of 1943.

625. Water Analysis. Five credit hours. Spring Quarter. Three lectures and six laboratory hours each week. Mr. Wirth.

Methods of sanitary and industrial water analysis, and interpretation of the analytical results

***626. Inorganic Micro and Semimicro Analysis.** Four credit hours. Winter Quarter. One lecture and nine laboratory hours each week. General prerequisites must include acceptable courses in quantitative analysis and inorganic or physical chemistry. Registration only by permission of the instructor. Mr. MacNevin.

Applications of micro, semimicro and microscopic methods to common problems.

628. Spectroscopic Analysis. Three to five credit hours. Winter Quarter. One lecture and two to four laboratory hours each week. Registration for more than three credit hours requires the permission of the instructor. Mr. Brode.

General principles of spectroscopic qualitative identification and quantitative estimation of the elements. Spectrophotometry of organic and inorganic compounds. Special applications to metallurgy, plant and biochemical analysis, identification of dyes and organic compounds.

641. Qualitative Organic Analysis. Four credit hours. Spring Quarter One lecture and nine laboratory hours each week. Mr. Wolfrom.

A study of the systematic methods of separation, purification, and identification of organic compounds.

642. Organic Micro and Semimicro Quantitative Analysis. Four credit hours. Autumn Quarter. One lecture and nine laboratory hours each week. General prerequisites must include acceptable courses in quantitative analysis and organic chemistry. Registration only by permission of the instructor. Mr. MacNevin.

Primarily a course in quantitative organic analysis using micro and semimicro methods. The common determinations of organic quantitative analysis are studied.

Given in the Summer of 1943.

647-648. Organic Chemistry. Three credit hours each. Autumn, Winter, and Spring Quarters. Three lectures or recitations each week. General prerequisites must include acceptable courses in general and analytical chemistry. Mr. Boord, Mr. Brode, Mr. Wolfrom, Mr. Henne.

The fundamental course in organic chemistry. Chemistry 647 is devoted to a discussion of the aliphatic hydrocarbons and their derivatives and Chemistry 648 to a discussion of the coal tar compounds.

Not open to students who have credit for Chemistry 451-452. Not available for graduate credit for students majoring in chemistry.

Given in the Summer of 1943.

*** Not given in 1943-1944.**

649. Organic Chemistry: Laboratory. Three credit hours. One Quarter. Autumn, Winter, Spring. Nine laboratory hours each week. Chemistry 647 must be included in the general prerequisites or taken concurrently. Mr. Brode, Mr. Boord, Mr. Wolfrom, Mr. Henne.

The laboratory work naturally belonging to Chemistry 675. The preparation of a series of typical organic compounds, their purification, and a study of their properties.

Not open to students who have credit for Chemistry 451-452. Not available for graduate credit for students majoring in chemistry.

Given in the Summer of 1943.

650. Organic Chemistry: Laboratory. Two or three credit hours. One Quarter. Autumn, Winter, Spring. Nine laboratory hours each week. General prerequisites must include Chemistry 649; Chemistry 648 must be included in the general prerequisites or taken concurrently. Mr. Brode, Mr. Boord, Mr. Wolfrom, Mr. Henne.

A continuation of Chemistry 649.

Given in the Summer of 1943.

654. X-rays and Crystal Structure. Four credit hours. Winter Quarter. Four lectures and recitations each week. General prerequisites must include calculus and one year of college physics. Given in alternate years. Mr. Harris, Mr. Blake, Mr. McCaughey.

This course is designed for those students of physics, chemistry, and mineralogy who intend to do research work in crystal structures and X-ray analysis.

This course is the same as Mineralogy 654 and Physics 654.

661. Systematic Inorganic Chemistry. Three credit hours. Autumn Quarter. Three lectures or recitations each week. General prerequisites must include acceptable courses in quantitative analysis and organic chemistry. Mr. McReynolds.

A systematic course in inorganic chemistry with emphasis upon the various types of inorganic compounds, their preparation, classifications, reactions, and pertinent theory. The chemistry of the binary compounds will be stressed.

Given in the Summer of 1943.

662. Systematic Inorganic Chemistry. Three credit hours. Winter Quarter. Three lectures or recitations each week. General prerequisites must include acceptable courses in quantitative analysis and organic chemistry. Mr. McReynolds.

A continuation of Chemistry 661 with emphasis upon the ternary and complex compounds.

***663. The Rare Elements.** Three credit hours. Spring Quarter. Three lectures each week. General prerequisites must include Chemistry 661 or equivalent. Mr. McReynolds.

Lectures on the chemistry of the less familiar elements, emphasizing their relations to the well-known elements, as well as their technical applications.

***668. Non-aqueous Solvents.** Three credit hours. Spring Quarter. Three lectures each week. Chemistry 683 must be included in the general prerequisites or taken concurrently. Given in alternate years. Mr. Verhoek.

A consideration of the properties of various solvents, the properties of electrolytes in non-aqueous solutions, the strength of acids and bases in non-aqueous solvents, and the non-aqueous analogues of the water system of compounds.

***672. Inorganic Chemistry: Laboratory.** Three credit hours. Spring Quarter. Nine laboratory hours each week.

a. Inorganic Preparations. Methods employed in the preparation of pure inorganic compounds. The chief classes of such compounds. The laboratory preparation of a number of examples sufficient to develop reasonable technique in applying the methods and to illustrate the classes.

b. Rare Elements. Laboratory work illustrative of the chemistry of the less familiar elements. The preparation of pure compounds of the rare elements using in many cases ores or industrial concentrates as starting materials.

c. Advanced Techniques. The use of some of the newer and more difficult techniques in the field of inorganic syntheses. These techniques include the use of liquefied gases, low and high temperature apparatus, high pressure and high vacua apparatus, etc.

* Not given in 1943-1944.

*675. **The Phase Rule.** Two credit hours. Spring Quarter. Two meetings each week. Given in alternate years. Mr. Mack.

A study of the phase rule and its applications in chemical research.

680. **Physical Chemistry.** Three credit hours. Winter Quarter. Three lectures or recitations each week. General prerequisites must include acceptable courses in physics and calculus. Mr. Garrett.

An introductory course in physical chemistry, adapted to the needs of students of ceramics.

681. **Physical Chemistry.** Three credit hours. One Quarter. Autumn, Winter, Spring. Three lectures each week. Acceptable courses in physics and two Quarters of calculus must be included in the general prerequisites or taken concurrently. It is recommended that Chemistry 691 be taken concurrently. Mr. France, Mr. Johnston, Mr. Harris, Mr. Mack.

The fundamental course in physical chemistry.

Not available for graduate credit for students majoring in chemistry.

Given in the Summer of 1943.

682. **Physical Chemistry.** Three credit hours. One Quarter. Autumn, Winter, Spring. Three lectures each week. General prerequisites must include Chemistry 681. It is recommended that Chemistry 693 be taken concurrently. Mr. France, Mr. Johnston, Mr. Harris, Mr. Mack.

A continuation of Chemistry 681.

Not available for graduate credit for students majoring in chemistry.

Given in the Summer of 1943.

683. **Physical Chemistry.** Three credit hours. One Quarter. Autumn, Winter, Spring. Three lectures each week. General prerequisites must include Chemistry 682. It is recommended that Chemistry 693 be taken concurrently. Mr. France, Mr. Johnston, Mr. Harris, Mr. Mack.

A continuation of Chemistry 682.

Not available for graduate credit for students majoring in chemistry.

Given in the Summer of 1943.

691-692-693. **Physical Chemistry: Laboratory.** Two credit hours. Autumn, Winter, and Spring Quarters. Six laboratory hours each week. An acceptable course in physical chemistry must be included in the general prerequisites or taken concurrently. These courses are designed to accompany Chemistry 681, 682, and 683, respectively. Mr. France, Mr. MacWood and assistants.

Quantitative measurements of phenomena of chemical interest and the application of chemical principles to their interpretation. The measurements include experiments in the determination of molecular weights and chemical constitution, thermochemistry, reaction rates, equilibria, electrochemistry, colloid chemistry, high vacuum, and glass blowing techniques, etc.

Given in the Summer of 1943.

695. **Colloid Chemistry.** Three credit hours. Winter Quarter. Three lectures or recitations each week. General prerequisites must include acceptable courses in physical chemistry or their equivalent. Mr. France.

A fundamental course in colloid chemistry.

696. **Theoretical Electrochemistry.** Three credit hours. Autumn Quarter. Three lectures or recitations each week. General prerequisites must include acceptable courses in physical chemistry or their equivalent. Mr. France.

A fundamental course in theoretical electrochemistry.

701. **Minor Problems in Chemistry.** One to fifteen credit hours. Any Quarter. Conference, library, and laboratory work. General prerequisites must include satisfactory courses in the field of the problem undertaken. A student may repeat this course and may spend all or any part of his time on it during a Quarter. Department Staff.

This course is designed to permit any properly qualified person to avail himself of the library and laboratory facilities of the department for carrying out a minor investigation or

* Not given in 1943-1944.

for adding to his knowledge and technique in some chemical subject. A student may exercise entire freedom in his choice of instructor to conduct his work in this course.

Given in the Summer of 1943.

782. Chemical Bibliography. One credit hour. Autumn Quarter. One conference each week. General prerequisites must include acceptable courses in analytical and organic chemistry. Mr. Garrett.

Designed to train the advanced student in the use of the chemical library, and to instruct him in the character of various chemical journals, dictionaries, reference books, and other sources of information pertaining to chemical subjects.

784. History of Chemistry. Two credit hours. Spring Quarter. Two lectures each week. General prerequisites must include acceptable courses in analytical and organic chemistry. Mr. Mack.

A general course in the history of chemistry with special reference to the development of the theories of the science.

Not open to students who have credit for Chemistry 783 and 830.

787-788-789. Thermodynamics. Three credit hours. Autumn, Winter, and Spring Quarters. An elective for Bachelor of Science seniors who have a grade of "B" or better in Chemistry 681-682-683. Mr. Johnston, Mr. Lassettre.

Training in the use of thermodynamics as a tool for solving chemical problems. Topics to be discussed include: vapor pressure; solutions and solubility; molecular spectra; free energy; modern theories of electrolytic dissociation; galvanic cells; and the various features associated with the measurement and control of chemical equilibria.

Not open to students who have credit for Chemistry 887-888-889.

NOTE: TEACHING COURSES. For the Teaching Course in this department see the Department of Education, Course 684.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include a thorough preparation in general inorganic chemistry, qualitative and quantitative analysis and introductory courses in organic chemistry and in physical chemistry (including laboratory courses in both subjects), acceptable courses in physics and mathematics, including calculus.

801-802-803. Systematic Course in Experimentation. Three credit hours. Autumn, Winter and Spring Quarters. Nine laboratory hours each week, including informal conferences. Required of all graduate students intending to become candidates for the Ph.D. degree. Mr. Harris and Department Staff.

A training in the fundamental experimental technique of chemical research. Glass-blowing, some shop practice, high vacuum techniques, construction of furnaces, measurement and control of temperature, electrical and optical instruments, fractional distillation and crystallization, criteria of purity, calibration, study of errors, micro manipulation, etc.

Chemistry 801 given in the Summer of 1943.

***822. Seminar in Analytical Chemistry.** Two credit hours. Winter Quarter. Two conferences each week. Mr. Wirth.

823. Seminar in Analytical Chemistry. Two credit hours. Spring Quarter. Two conferences each week. Mr. Moyer.

Topic for 1943-1944: To be announced.

824. Seminar in Analytical Chemistry. Two credit hours. Autumn Quarter. Two conferences each week. Mr. MacNevin.

Topic for 1943-1944: Optical Methods of Analysis.

841. **Advanced Organic Chemistry.** Three credit hours. Autumn Quarter. Three lectures each week. Mr. Boord.

An advanced course in the fundamental principles of organic chemistry, covering the chain hydrocarbons and their derivatives.

* Not given in 1943-1944.

842. Advanced Organic Chemistry. Three credit hours. Winter Quarter. Three lectures each week. Mr. Wolfrom.

A continuation of Chemistry 841, covering the carbocyclic compounds, including aromatic, hydroaromatic, and terpene derivatives.

843. Advanced Organic Chemistry. Three credit hours. Spring Quarter. Three lectures each week. Mr. Brode.

A continuation of Chemistry 841 and 842 covering the heterocyclic compounds with special emphasis upon nitrogen derivatives.

844-845. Advanced Organic Chemistry: Laboratory. Three credit hours. Both 844 and 845 are given Autumn, Winter, Spring. Nine hours of library, conference, and laboratory work each week. Chemistry 841 and 842 must be included in the general prerequisites or taken concurrently. Mr. Boord, Mr. Brode, Mr. Wolfrom, Mr. Henne, Mr. Newman.

An advanced course in the synthesis of aliphatic (844) and aromatic (845) compounds and a study of their chemical characteristics. Selection may be made from the following topics to supplement the student's previous training and to develop his laboratory technique:

I. **Synthetic Preparations**, involving the use of the standard procedures for alkylation, esterification, condensation, ring closure, oxidation, reduction and nuclear substitution. Particular emphasis will be placed upon the yields and purity of products.

II. **Special Methods and Techniques.**

a. Catalytic hydrogenation.
b. Electro-chemical preparations.
c. Resolution of optically active compounds.
d. Preparation of research intermediates.

These courses lead directly to minor research problems in the field of organic chemistry.

Given in the Summer of 1943.

847. Theoretical Organic Chemistry. Three credit hours. Autumn Quarter. Three lectures or discussions each week. General prerequisites must include one year of graduate work in chemistry including Chemistry 841 and 842 or their equivalent. Mr. Brode.

A discussion of the structural theory of organic chemistry, tetravalent carbon, homology, chemical and physical isomerism and stereochemistry.

848. Theoretical Organic Chemistry. Three credit hours. Winter Quarter. Three lectures or discussions each week. General prerequisites must include one year of graduate work in chemistry including Chemistry 841 and 842 or their equivalent. Mr. Newman.

A discussion of molecular rearrangements, including the theories which have been evolved for their explanation.

849. Theoretical Organic Chemistry. Three credit hours. Spring Quarter. Three lectures or discussions each week. General prerequisites must include one year of graduate work in chemistry including Chemistry 841 and 842 or their equivalent. Mr. Boord.

A discussion of the nature and types of organic reactions, including theories and reaction mechanism.

850. Seminar in Organic Chemistry. Three credit hours. Winter Quarter. Three conference hours each week. General prerequisites must include Chemistry 841 and 842. Mr. Wolfrom.

Topic for 1943-1944: The Chemistry of the Vitamins and Hormones.

851. Seminar in Organic Chemistry. Three credit hours. Spring Quarter. Three conference hours each week. General prerequisites must include Chemistry 841 and 842. Mr. Boord.

Topic for 1943-1944: To be announced.

852. Seminar in Organic Chemistry. Three credit hours. Autumn Quarter. Three conference hours each week. General prerequisites must include Chemistry 841 and 842. Mr. Newman.

Topic for 1943-1944: Synthesis of Carbocyclic Compounds.

†853. **Seminar in Organic Chemistry.** Three credit hours. Three conferences each week. General prerequisites must include Chemistry 841 and 842. Mr. Henne.

Given in the Summer of 1943.

*854. **Seminar in Organic Chemistry.** Three cvredit hours. Spring Quarter. Three conference hours each week. General prerequisites must include Chemistry 841 and 842. Mr. Brode.

Open to auditors and advanced students not working for credit.

866. **Seminar in Inorganic Chemistry.** Two credit hours. Autumn Quarter. Two conferences each week. Mr. McReynolds.

Topic for 1943-1944: Complex Compounds.

881. **Chemical Kinetics.** Three credit hours. Autumn Quarter. General prerequisites must include Chemistry 681-682-683. Mr. Verhoek.

A study of the velocity of chemical reactions in both homogeneous and heterogeneous systems, chiefly for gaseous reactions.

885. **Molecular Spectra and Structure.** Three credit hours. Spring Quarter. General prerequisites must include Chemistry 647-648, 681-682-683 and Physics 626 and 627. Mr. Johnston.

Molecular structure is taken up from the quantum standpoint with particular emphasis on band spectra, the correlation of atomic and molecular electronic states, energy level diagrams worked out for some typical molecules, potential energy curves, optical dissociation, predisassociation, fluorescence and Raman spectra, infra-red absorption, continuous absorption, isotope effects, ortho and para molecular states, the determination of bond distances and bond angles, quantum mechanical resonance, the strengths of linkage in organic molecules, and applications to chemical thermo-dynamics and photo-kinetics.

890. **Seminar in Physical Chemistry.** Three credit hours. Spring Quarter. Three conferences each week. Mr. Johnston.

Topic for 1943-1944: To be announced.

*891. **Seminar in Colloid Chemistry and Electrochemistry.** Three credit hours. Spring Quarter. Three conferences each week. Mr. France.

*892. **Seminar in Physical Chemistry.** Three credit hours. Spring Quarter. Three conferences each week. General prerequisites must include Chemistry 681-682-683. Mr. Harris.

893. **Seminar in Physical Chemistry.** Three credit hours. Autumn Quarter. Three conferences each week. General prerequisites must include Chemistry 681-682-683. Mr. Lassettre.

Topic for 1943-1944: Electronic Structure of Polyatomic Molecules.

894. **Seminar in Physical Chemistry.** Two credit hours. Winter Quarter. Two conferences each week. General prerequisites must include Chemistry 681-682-683. Mr. Verhoek.

Topic for 1943-1944: Kinetics for Polymerization Reactions.

*895. **Seminar in Physical Chemistry.** Two credit hours. Winter Quarter. Two conferences each week. General prerequisites must include Chemistry 681-682-683. Mr. Garrett.

*896. **Seminar in Physical Chemistry.** Two credit hours. Winter Quarter. Two conferences each week. General prerequisites must include Chemistry 787-788-789. Mr. MacWood.

950. **Research in Chemistry.** Autumn, Winter, and Spring Quarters. Library, conference, and laboratory work. General prerequisites must include

* Not given in 1943-1944.
† Not given during the academic year, 1943-1944.

acceptable courses in the chosen field of research. The student may spend a part or all of his time on research work. Department Staff.

Research is carried on in the fields of analytical, inorganic, organic and physical chemistry, and in colloid and electrochemistry.

Given in the Summer of 1943.

NOTE: Attention is called to the fact that courses in physiological chemistry are listed elsewhere in this Bulletin under the Department of Physiological Chemistry and Pharmacology.

NOTE: For Industrial Chemistry, Applied Electrochemistry, and Chemical Engineering Courses see the Department of Chemical Engineering.

CIVIL ENGINEERING
Office, 107 Brown Hall

PROFESSORS MORRIS, CODDINGTON, (EMERITUS), SLOANE, SHANK, PRIOR, AND LARGE, ASSOCIATE PROFESSORS MONTZ, WALL, AND MARSHALL, ASSISTANT PROFESSOR JOHNSTONE

600 and 700 courses do not carry graduate credit if these courses or their equivalents were used in fulfilling the requirements for the Bachelor's degree.

In addition to the requirements found elsewhere in this bulletin, the candidate for an advanced degree shall have received a Bachelor's degree in some branch of engineering or in the fundamental engineering sciences from a recognized engineering school plus satisfactory engineering experience.

It is important that the candidate's record in the fundamental subjects of Mathematics, Physics, and also in Chemistry in certain fields of engineering, be well above the average.

A graduate student may prosecute studies in the following branches in the field of Civil Engineering: (a) Structural Engineering, (b) Sanitary Engineering and Water Supply Engineering, (c) Highway Engineering, (d) Transportation Engineering, (e) Geodetic Engineering and Photogrammetry.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

609. Adjustment of Observations. Three credit hours. Winter Quater. Three two-hour laboratory periods each week. General prerequisites must include analytic geometry, railroad surveying and advanced surveying. Mr. Marshall, Mr. Montz.

Theory of adjustment of observations, using work of preceding term; precise maps.

610. Masonry Materials. Five credit hours. Winter Quarter. Three recitations and two laboratory periods each week. Mechanics 602 must be included in the general prerequisites or taken concurrently. Mr. Large.

Recitations and laboratory work in concrete and other masonry materials; foundations.

Given in the Summer of 1943.

612. Earth Engineering. Three credit hours. Spring Quarter. Two three-hour laboratory periods each week. General prerequisites must include Civil Engineering 610 and Mechanics 602 and 610. Mr. Large.

Investigation and analysis of earths for engineering structures.

701. Reinforced Concrete Design. Five credit hours. Autumn Quarter. Three recitations and two three-hour laboratory periods each week. General prerequisites must include Civil Engineering 610 or a course in cement and concrete; Mechanics 605 must be included in the general prerequisites or taken concurrently. Mr. Large, Mr. Prior.

Theory and design of reinforced concrete structures.

703. Water Supply Engineering. Five credit hours. Winter Quarter. Five recitations each week. General prerequisites must include Mechanics 605 and 610. Mr. Prior.

Construction and operation of public water supplies.

Given in the Summer of 1943.

705. Masonry Structures. Five credit hours. Spring Quarter. Five recitations each week. General prerequisites must include Civil Engineering 612 and 701. Mr. Prior.

Application of principles of civil engineering to various masonry structures.

709. Geodetic Engineering. Three credit hours. Autumn Quarter. Three lectures each week. General preprequisites must include Civil Engineering 609. Mr. Marshall.

Trigonometric reconnaissance, use of geographic coordinates, and problems involving figure of the earth.

711. Elementary Structural Engineering. Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include Mechanics 602. Mr. Shank.

Theory and design of steel and reinforced concrete beams, columns and trusses

712. Trusses. Five credit hours. Autumn Quarter. Five recitations each week. General prerequisites must include Mechanics 602. Mr. Shank, Mr. Large.

Stresses in and design of simple steel trusses and building frames.

713. Reinforced Concrete Design. Five credit hours. Spring Quarter. Five recitations each week. General prerequisites must include Mechanics 602. Mr. Large.

A course for architectural engineers, similar to Civil Engineering 701.

715. Timber Construction. Five credit hours. Winter Quarter. Three recitations and two laboratory periods each week. General prerequisites must include Mechanics 601 and 602. Mr. Sloane, Mr. Montz.

Lectures on wood and its application to design of engineering structures.
Given in the Summer of 1943.

717. Framed Structures. Five credit hours. Winter Quarter. Five recitations and ten hours of preparation each week. General prerequisites must include Mechanics 602. Mr. Shank.

An elementary course in stresses and design of welded and riveted steel trusses and steel and concrete frames.
Given in the Summer of 1943.

730. Transportation Engineering. Three credit hours. Autumn Quarter. Three recitations each week. General prerequisites must include Civil Engineering 604 and 605. Mr. Montz.

Engineering economics illustrated by rail, highway, water and air transportation.

732. Contracts and Specifications. Three credit hours. Spring Quarter Three recitations each week. Mr. Prior.

Professional practice and principles underlying engineering contracts and specifications.

733. Rigid Frame Structures. Three credit hours. Autumn Quarter. Three recitations each week. General prerequisites must include Civil Engineering 712 or 613. Mr. Large, Mr. Morris.

Stresses in and design of steel-frame office buildings.

734. Advanced Bridges. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include Civil Engineering 613 or 712. Mr. Morris.

Stresses in and design of arch bridges.

738. Highway Plans and Surveys. Three credit hours. Autumn Quarter. One recitation and two three-hour laboratory periods each week. General prerequisites must include courses in roads and pavements. Mr. Sloane.

Reconnoissance and location surveys, alignment and grades, curve widening and superelevation, bridge and culvert surveys, preparation of plans and estimates, study of highway standards.

739. Bituminous Roads and Surfaces. Three credit hours. Winter Quarter. One recitation and two three-hour laboratory periods each week. General prerequisites must include a course in roads and pavements. Mr. Sloane.

Study of various types of bituminous roads now in use, plant layout and construction details, analysis of specifications and study of current literature on maintenance, renewals and surface treatments, laboratory tests of asphalts, tars, and oils.

799. Advanced Civil Engineering. Three to five credit hours. One Quarter. Autumn, Winter, Spring. In addition to the general prerequisites, permission of the chairman of the department. All instructors.

This course is intended to give the advanced student opportunity to pursue advanced study. Work undertaken may be elected in the field of highways, structures, sanitary engineering, water supply, geodetic engineering, transportation, and other special fields in civil engineering.

(a) Advanced Reinforced Concrete Design.
(b) Advanced Structural Design.
(c) Advanced Sanitary Engineering.
(d) Advanced Transportation Engineering.
(e) Photogrammetry.
(f) River Hydrology.

A student may repeat this course until he has obtained a maximum of twenty credit hours. He may accumulate not more than ten credit hours in any one of the above subdivisions.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Civil Engineering. Credit hours to be arranged. Autumn, Winter, and Spring Quarters. All instructors.

CLASSICAL LANGUAGES AND LITERATURE
Office, 217 Derby Hall

PROFESSORS TITCHENER, HODGMAN (EMERITUS), AND BOLLING (EMERITUS), ASSISTANT PROFESSORS HOUGH AND ABBOTT, MR. JONES

(See page 59 for the program in Ancient History and Literature.)

Prerequisites for Admission to Graduate Work: The student must have an undergraduate major (or its equivalent) in a university or college of recognized standing. In case of question, the Department will offer a proficiency examination.

The field of study in the Department of Classical Languages includes all classical antiquity. Basic courses deal with the literature or literatures, the science of language study and methods of research, including an introduction to textual criticism. Specialization, particularly in the final year of graduate work, may lead to literary, linguistic, social, historical, economic or other aspects of ancient civilization.

Requirements for the Master's Degree: (a) *History and criticism of Latin (or Greek) literature.* If Latin is the major study, Greek is strongly advised but not required. (b) *Linguistic and Archaeology.* If one language only is studied, linguistics and archaeology must be substituted for the second language. (c) At least two Quarters of *methods of research.*

Requirements for the Degree Doctor of Philosophy: *General Examinations* — These general examinations, written and oral, are planned to determine the candidate's ability in the translation of Greek and Latin, knowledge of literary history, and specialized knowledge of a single author, chosen by the candidate in consultation with his adviser. Auxiliary fields, such as linguistics, archaeology, bibliography, and ancient history, will be included and in individual cases such specialized subjects as palaeography, epigraphy, metrics, etc. (b) A wide knowledge of one literature, based on extensive reading, and a sound reading knowledge of the second. At least three Quarters of linguistics.

GREEK

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

610. Private Reading and Minor Problems. Two to five credit hours. One Quarter. Autumn, Winter, Spring. General prerequisites should include a course in Homer. Mr. Hough, Mr. Jones.

Passages for private reading and topics for investigation will be suggested to meet the needs of individual students.

NOTE: For course in Principles of the Historical Study of Language, see German 705.

LATIN

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

†608. Roman Art and Archaeology. Three credit hours. Autumn Quarter. Three lectures each week. General prerequisites must include for majors in Classical Languages, six Quarters of college Latin; for students in the Department of Fine Arts, Fine Arts 651; other qualified students may be admitted by special arrangement.

Study of Roman architecture, sculpture, and painting. Lectures, discussions and reports on special topics.

Given in the Summer of 1943.

612. Latin Prose Composition: First Course. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include five Quarters of college Latin. Mr. Abbott.

Exercises and lectures on Latin idiom and style.

615. Proseminar I. Three credit hours. Winter Quarter. Three lectures each week. General prerequisites must include six Quarters of college Latin. Mr. Abbott, Mr. Hough.

Lectures on the life and period of Cicero; readings from the Letters and Essays. Latin 615 is designed especially for students preparing to teach Latin.

616. Proseminar II. Three credit hours. Spring Quarter. Three lectures each week. General prerequisites must include six Quarters of college Latin. Mr. Titchener, Mr. Hough.

Lectures on the life and works of Vergil, and his influence on modern literature; readings from the Eclogues and the Georgics. Latin 616 is designed especially for students preparing to teach Latin.

Given in the Summer of 1943.

617. Proseminar III. Three credit hours. Autumn Quarter. Three lectures each week. General prerequisites must include six Quarters in college Latin. Mr. Hough.

Lectures on topics suggested by the study of Caesar's Gallic and Civil Wars; special consideration of literary style, political and military campaigns. Latin 617 is designed especially for students preparing to teach Latin.

627. Vulgar Latin. Three credit hours. Winter Quarter. General prerequisites must include six Quarters of college Latin, or French 801, or the consent of the instructor must be obtained. Mr. Abbott.

Lectures and the study of texts and inscriptions illustrating the development of the popular speech.

631. Private Reading and Minor Problems. One to six credit hours. One Quarter. Autumn, Winter, Spring. General prerequisites must include one

† Not given during the academic year, 1043-1944.

reading course more advanced than Latin comedy. Mr. Titchener, Mr. Hough, Mr. Abbott.

Passages for private reading and topics for investigation will be suggested to meet the needs of individual students.

Given in the Summer of 1943.

650-651-652. History of Roman Literature. Three credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include three reading courses more advanced than Latin comedy. The content of the readings within this course is so extensive that graduate students may repeat this course for credit. Mr. Titchener.

Lectures and assigned reading in literary histories on the development of Roman literature; required and suggested passages for translation in each author studied: brief weekly reports.

Latin 651 given in the Summer of 1943.

720. Introduction to Historical Greek and Latin Grammar. Three credit hours. Autumn Quarter. General prerequisites must include ten hours of advanced work in the classics. Mr. Abbott.

*721-*722. Historical Greek and Latin Grammar. Three credit hours each Quarter. Winter and Spring Quarters. General prerequisites must include ten hours of advanced work in the classics. Mr. Abbott.

755. Advanced Archaeology. Three credit hours. Spring Quarter. General prerequisites must include ten hours of Classical Languages or the history of the fine arts. Mr. Hough.

Lectures and reports in the fields of painting, sculpture, architecture and archaeology. Particular attention will be given to the topopgraphy and excavations of the city of Rome.

Not open to students who have credit for Latin 655.

756. Advanced Archaeology. Three credit hours. Winter Quarter. General prerequisites must include ten hours of Classical Languages or the history of the fine arts. Mr. Hough.

Not open to students who have credit for Latin 656.

NOTE: TEACHING COURSE. For the Teaching Course in this department see the Department of Education, Course 694.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

800. Seminar. Three credit hours. Autumn, Winter, and Spring Quarters. Mr. Titchener, Mr. Hough, Mr. Abbott.

Textual criticism and research problems. The author to be studied will be assigned by the instructor.

Given in the Summer of 1943.

950. Research in Classical Languages. Autumn, Winter, and Spring Quarters. The staff.

Given in the Summer of 1943.

COMPARATIVE LITERATURE AND LANGUAGE

Courses formerly offered under the above heading will be found under the Departments of Classical Languages and Literature, and German.

DAIRY SCIENCE

Advisory Committee: Robert B. Stoltz, Louis H. Burgwald, Dairy Technology: Thomas S. Sutton, Animal Husbandry; John F. Lyman, Agricultural Chemistry; Harry H. Weiser, Bacteriology; and W. E. Krauss, Ohio Agricultural Experiment Station.

Graduate instruction leading to the Ph.D. degree in Dairy Science is administered by an inter-departmental advisory committee representing the departments concerned. This inter-

* Not given in 1943-1944.

departmental program is available only to students who are candidates for a Ph.D. degree in Dairy Science. Students interested in a Master's degree in any phase of dairy science must select the appropriate departments in which to secure that degree. The graduate courses in dairy science are listed under four different departments: (1) Agricultural Chemistry; (2) Animal Husbandry; (3) Bacteriology; and (4) Dairy Technology. A candidate for the Ph. D. degree in Dairy Science may select from these and cognate courses those which provide the preparation which he desires.

Prerequisites. Applicants for admission to a program of graduate study leading to a Ph.D. degree in Dairy Science must have completed the requirements for a Master's degree in some field of dairy science such as dairy technology, dairy chemistry, dairy bacteriology, animal nutrition, etc., or present evidence of equivalent experience and training.

Before a candidate for a Ph.D. degree in Dairy Science can take the general examination for that degree he must have satisfactorily completed the following work or its equivalent in courses open to advanced undergraduates and graduates or those open only to graduates: (1) organic chemistry, 10 hours; (2) physical chemistry, 5 hours; (3) colloidal chemistry, 3 hours; (4) biological chemistry, 5 hours; (5) dairy chemistry, 10 hours; (6) chemistry of nutrition, 5 hours; (7) bacteriology, 17 hours; (8) dairy technology and dairy production, 20 hours.

The general written examination for the Ph.D. degree in Dairy Science will cover the following special fields: (1) dairy technology and dairy production; (2) organic, physical, colloidal, physiological and dairy chemistry; (3) general and dairy bacteriology; (4) human and animal nutrition.

Dissertation. The subject of the dissertation may be chosen from any field of dairy science after consultation with the Advisory Committee and it must be approved by the Advisory Committee. The adviser immediately in charge of the dissertation will be selected by the Advisory Committee in consultation with the student.

Before undertaking a program of graduate study designed to lead to a Ph.D. degree in Dairy Science, a student must carefully outline his entire program and have it approved by the Advisory Committee.

For courses which should be elected as preparation for a Ph. D. degree in Dairy Science reference should be made to the departmental announcements of Agricultural Chemistry, Animal Husbandry, Bacteriology, and Dairy Technology.

DAIRY TECHNOLOGY
Office, 111 Townshend Hall

PROFESSORS STOLTZ AND BURGWALD, ASSISTANT PROFESSOR ERB

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

605. Management of Dairy Plants. Five credit hours. Winter Quarter Three discussion periods and one four-hour laboratory period each week. General prerequisites must include Dairy Technology 607 and 610. Dairy Technology 608 must be included in the general prerequisites or taken concurrently. Mr. Stoltz.

Lectures will be given on the organization, construction, and operation of milk plants, creameries, cheese factories, condenseries, and ice cream plants. The purchasing of milk and milk products by various methods, the importance of sanitation, employing of help, and the purchasing of supplies will be discussed. Trips will be taken to various plants weekly and written reports will be required regarding the efficiency and housekeeping of plants visited.

606. Dairy Equipment. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include elementary courses in physics.

A study of the principles of construction, operation, and maintenance of dairy plant equipment including pasteurizers, bottle washers, can washers, homogenizers, milk coolers, separators, churns, pumps, sanitary pipe lines, etc. Elements to be considered in the design and construction of the dairy plant will be included.

607. Market Milk. Five credit hours. Autumn Quarter. Three discussion periods and two three-hour laboratory periods each week. General prerequisites must include Bacteriology 607, 610, 611. Mr. Burgwald.

This course deals with the fluid industry, including processing and distribution of milk and cream for city trade. Considerable attention will be given to plant operations and problems pertaining thereto. The laboratory work will consist of the application of bacteriology and

chemistry to the production of quality products. Training and practice will be given in milk inspection from the standpoint of the Board of Health and the city milk plant.

Given in the Summer of 1943.

608. Hard Cheese Manufacturing. Five credit hours. Winter Quarter. Two discussion periods and one eight-hour laboratory period each week. General prerequisites must include Bacteriology 607, 610, and 611. Mr. Burgwald.

Lectures will take up the methods of manufacturing cheddar, Swiss, brick, and Limburger cheese, the method of paying for milk at cooperative cheese factories and the scoring of American cheese. Laboratory work will consist of the making of cheddar cheese from both raw and pasteurized milk, Swiss cheese by the use of the eye-forming culture, brick, Limburger, and farm cheese.

609. Condensed Milk and Dry Milk. Three credit hours. Autumn Quarter. Two discussion periods and one three-hour laboratory period each week. General prerequisites must include Bacteriology 607 and a course in dairy chemistry. Mr. Erb.

A study of condensed milk and dry milk manufacture. Special emphasis will be given to the questions of heat stability of milk, the salt balance, and lactose crystallization. Laboratory work will consist of practical work in the operation of vacuum pans, sterilization of milk, and visits to milk condenseries and powder plants in the vicinity of Columbus.

610. Ice Cream Manufacturing. Five credit hours. Autumn Quarter. Three discussion periods and two three-hour laboratory periods each week. General prerequisites must include Bacteriology 607 and a course in dairy chemistry. Dairy Technology 609 must be taken concurrently. Mr. Erb.

The course deals with the modern ice cream industry and has to do with manufacturing operations, distribution methods and sales activities. Considerable attention is given to the physico-chemical aspects of ice cream and how these enter into modern processing procedure. Laboratory work consists of processing ice cream and visiting manufacturing plants.

615. Dairy Products Scoring. Three credit hours. Spring Quarter. One lecture and two two-hour laboratory periods each week. Mr. Erb.

An advanced class for students who are majoring in dairy technology and who desire to take up judging of milk, butter, ice cream, and cheese in the commercial field.

701. Special Problems. Three to fifteen credit hours, taken in units of three or five hours each Quarter, for one or more Quarters. Autumn, Winter, Spring. One hour conference each week. Mr. Stoltz, Mr. Burgwald, Mr. Erb.

This course is designed for students majoring in dairy technology and consists in working out special problems along the lines in which they are specializing.

Given in the Summer of 1943.

702. Dairy Seminar. One credit hour. Autumn, Winter, and Spring Quarters. One hour conference each week. Open to seniors and graduate students who are specializing in dairy technology and to those who have permission of the instructor. During this seminar seniors will report on problems or special references. Graduate students will make a report of their problems. Instructors in allied departments of the University will be requested to take part in this seminar.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Dairy Technology. Autumn, Winter, and Spring Quarters. One hour conference each week. General prerequisites must include at least twenty hours of work in the department, and the consent of the instructor must be obtained. Mr. Stoltz, Mr. Burgwald, Mr. Erb.

Research work in Dairy Technology is conducted under the supervision of Mr. Stoltz, Mr. Burgwald, and Mr. Erb. Any apparatus or equipment on hand will be furnished and room will be arranged for those desirous of studying problems pertaining to market milk, ice cream, butter, cheese, evaporated milk, milk powder, buttermilk, or other dairy products. Students desiring to work on some problems, such as plant management, dairy bacteriology, dairy chemistry, nutrition, cost accounting, can arrange to carry on the work as though it were in one department and college.

DENTISTRY

Office, 117 Hamilton Hall

PROFESSORS POSTLE, SNYDER, JONES, KITCHIN, HEBBLE, BOUCHER, AND STROSNIDER, ASSOCIATE PROFESSORS SHUMWAY AND STARR, ASSISTANT PROFESSORS WILTBERGER, WADE, AND SPANGENBERG

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include adequate preparation in technical courses concerned.

701-702-703. Minor Problems in Operative Dentistry. One to three credit hours. Autumn, Winter, and Spring Quarters.

Students will have assigned to them special problems in Operative Dentistry.

704-705-706. Minor Problems in Prosthesis. One to three credit hours. Autumn, Winter, and Spring Quarters.

Students will have assigned to them special problems in Prosthesis.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

801. Special Problems in Clinical Oral Surgery and Anesthesia. One to five credit hours. Repeated in Autumn, Winter, and Spring Quarters for two years. Required of all students majoring in Oral Surgery. Mr. Snyder, Mr. Spangenberg.

The importance of accurate diagnosis and good judgment in bringing the treatment of surgical conditions of the teeth and contiguous structures to a satisfactory conclusion will be stressed. Advanced surgical techniques and practical procedures with special emphasis on the related basic fields of anatomy, physiology, and pathology. Recent advances in local and general anesthesia and their relation to practical procedures will be considered.

802. Special Problems in Clinical Orthodontics. One to five credit hours. Repeated in Autumn, Winter, and Spring Quarters for two years. Required of all students majoring in Orthodontics. Mr. Jones, Mr. Wade.

The construction of special appliances. The manipulation of appliances in treatment of dental and associated deformities. Consideration of growth problems in relation to orthodontic procedures.

803. Special Problems in Clinical Periodontia. One to five credit hours. Repeated in Autumn, Winter, and Spring Quarters for two years. Required of all students majoring in Periodontia. Mr. Spangenberg.

Diagnosis and treatment of Periodontal disease. Emphasis will be placed on correlation between the diseases of the periodontium to probable systematic maladjustments as well as maladjustments of a purely dental nature.

804. Histological Laboratory Technique. One to three credit hours. Autumn and Winter Quarters. Required of all graduate students in Dentistry. Mr. Kitchin.

The preparation of oral and dental tissues for microscopic study, including tissue fixation, grinding of tooth and bone sections, decalcification of combined hard and soft tissues with subsequent celloidin embedding, paraffin embedding of soft tissues, cutting of embedded material, staining and mounting and study of sections.

805. Seminar in Dentistry. One credit hour. Repeated in Autumn, Winter, and Spring Quarters for two years. One seminar each week. Required of all graduate students in Dentistry. Mr. Jones, Mr. Snyder, Mr. Kitchin, Mr. Spangenberg, Mr. Boucher.

The purpose of these seminars is to acquaint those whose interest is specialized with recent advances in all branches of dental science. Instructors and students will participate and subjects will be assigned with reference to the field of the individual's specialization. Review of original literature will form a basis for such discussions. The following topics will be considered: (1) Problems in diagnosis and treatment of surgical conditions of the oral cavity and contiguous structures. (2) Correlation of problems in Periodontia with related sciences. Physiology and Pathology of the bone will be considered. The relation of nutrition to Periodontia will be discussed. (3) A study of special topics related to Orthodontics. (4) Problems in Roentgeno-

graphic diagnosis will be discussed with special emphasis on existing microscopic pathology. (b) Discussion of special topics in the fields of Dental Histology and Embryology.

806. **Special Problems in Clinical Prosthesis.** One to five credit hours. Repeated in Autumn, Winter and Spring Quarters for two years. Required of all students majoring in Prosthesis. Mr. Boucher and assistants.

The diagnosis and treatment of lost or congenitally absent parts of the mouth and face by means of prosthetic appliances. The construction of special prosthetic appliances.

950. **Dental Research.** Credits to be arranged. Autumn, Winter, and Spring Quarters.

DRAWING

(See Engineering Drawing)

ECONOMICS

Office, 101 Commerce Building

PROFESSORS BOWERS, WOLFE, HAYES, DICE, HELD, KIBLER, SALZ, SMART, AND JAMES, ASSOCIATE PROFESSORS BITTERMANN, HERBST, AND PATTON, ASSISTANT PROFESSORS ROWNTREE, EGLE, KIMBALL, AND WELSH

Prerequisites for Graduate Work: The undergraduate preparation for students specializing in economics should include in addition to basic courses in economics, elementary courses in at least five of the following subjects: accounting, anthropology, business organization, geography, history, mathematics, philosophy, political science, psychology, and sociology. When undergraduate preparation is inadequate, in the judgment of the committee, courses in economics or related subjects may be required in addition to the ordinary requirements for degrees.

Departmental Committee on Graduate Work: The departmental committee on graduate work has general supervision of the programs of students regularly admitted to the Graduate School, who wish to take advanced degrees in economics. Students should report to the chairman of this committee early in their first Quarter of residence.

MASTER'S DEGREE: The candidate for the Master's degree in economics must meet certain minimum requirements: (1) in the general principles of economics; (2) in the history of economic thought and processes, for which Economics 801-802-803 or its equivalent is necessary; (3) in elementary statistics, which, if it has not been taken as an undergraduate course, may be obtained by taking Economics 807; (4) An adequate preparation in the field of the thesis satisfactory to the thesis advisers.

Satisfaction of the first three requirements will be determined on the basis of a written examination given in the fourth week of the Quarter in which the degree is to be taken. Students will not be admitted to candidacy until the topics of their theses have been approved by the departmental committee on graduate work.

DOCTOR'S DEGREE: The candidate for the Doctor's degree in economics should have a broad and liberal training, such as will enable him to approach his work in a scientific, critical, and constructive spirit; and from a broad social point of view rather than from that of a narrow special interest. In order to attain this point of view, he should have gained familiarity with the progress which has been made not only in economics but also in the other social sciences, as well as in philosophy and psychology. A reasonable acquaintance with European and American history is presupposed. The candidate should have an elementary knowledge of calculus, and shall have a knowledge of statistics at least equivalent to Economics 807-808-809. He shall have a reading knowledge of two foreign languages acceptable to the committee on graduate work, preferably French and German.

The more specific requirements for the Doctor's degree in economics include the following:

(1) The minimum requirements for the Master's degree as given above:

(2) Concentration in four of the following fields, one of which shall be Economic Theory; the preparation shall cover the entire field without limitation to particular courses:
   (a) Economic theory;
   (b) Economic history;
   (c) Labor problems and economic reform;
   (d) Theory of money and credit;
   (e) Public finance;
   (f) International economic relations;
   (g) Social control of industry (transportation, public utilities, economic planning).

(3) One or more subjects taken in other departments of the university, selected with the approval of the professor in charge of the candidate's dissertation.

The adequacy of preparation in fields (2) and (3) will be tested by written and oral exam-

inations, which must be passed before admission to candidacy. Topics for dissertations must be approved by the departmental committee on graduate work at least two Quarters before the degree may be taken. Detailed statements of the forms of application for examinations and approval of dissertation topics may be obtained from the chairman of the committee on graduate work.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601-602-603. Principles of Economics; Advanced Course. Three credit hours. Three Quarters. 601, Autumn; 602, Winter; 603, Spring. Three class meetings each week. Mr. Hayes, Mr. Bittermann.

This course is designed to provide a more thorough and critical consideration of economic principles than is possible in the elementary courses. It attempts to arrive at some understanding of the more fundamental principles involved in the present changing economic system.

604-605. Current Economic Problems. Three credit hours. Two Quarters. 604, Autumn; 605, Winter. Three class meetings each week. Mr. Hayes.

A lecture and discussion course providing a survey and analysis of some of the leading current economic issues, especially those connected with the economic functions of the Federal administration, agricultural adjustment, development of natural resources, provision for the aged and unemployed, tariff adjustment, and industrial self-government.

616. Corporation Economics. Five credit hours. Autumn Quarter. Five meetings each week. Mr. Kimball.

A survey of corporation organization and finance; corporate securities and their uses, corporate income and dividend policies, economic aspects of corporate expansion and combination, corporate reorganizations, economic basis for public regulation of corporations. Designed for students not registered in the College of Commerce and Administration.

Not open to students who have credit for or who are taking Business Organization 650.

618. Transportation Economics. Five credit hours. One Quarter. Winter and Spring. Five class meetings each week. Mr. Kibler.

A general survey of the history and regulation of inland transportation agencies, and a discussion of current problems of transportation and regulation, for students with a general interest in the field of economics as well as for those with a special interest in transportation.

619. Air Transportation. Three credit hours. Spring Quarter. Three class meetings each week.

Historical background and economic aspects of air transportation. Routes and services. Interrelationships of air, railroad, highway, and ocean transportation. Airline operating costs in relation to types of equipment and ground facilities. Economic principles of rate-making. Government control and assistance to airline operations.

624. Principles of Insurance. Three credit hours. One Quarter. Autumn, Winter, Spring. Three class meetings each week. Mr. E. L. Bowers.

A study of the theory and practice of the principal types of insurance in the life, fire, and casualty fields. The economic theory of risk; loss prevention; state supervision, etc.

625-626. Analysis and Control of Business Cycles. Two credit hours. Two Quarters. 625, Winter; 626, Spring. Mr. Hayes.

A general survey of changes in price levels and production. Past and current theories of business cycles. Proposed plans for the control of economic fluctuation.

631-632-633. Public Finance. Three credit hours. Three Quarters. 632, Autumn; 633, Winter; 631, Spring. Mr. Walradt.

A study of the problems connected with the debts, expenditures, revenues, and fiscal administration of national, state, and municipal governments.

Economics 631 given in the Summer of 1943.

634-635. International Economic Problems. Three credit hours. Two Quarters. 634, Autumn; 635, Winter. Mr. Calderwood.

Adjustment in the balance of international payments; commodity and capital movements; gold shipments, etc. Trade agreements of the United States; managed paper currencies vs. gold standards; unemployment and international policy; import quotas and exchange control; clearing agreements and barter transactions; expansion of trade in the Western Hemisphere; dislocations of war and reconstruction of world trade.

637. Labor Relations. Five credit hours. Autumn Quarter. Five class meetings each week. Miss Herbst.

The problems of labor considered with reference to the labor movement; the history of trade unionism; types; theories; policies; methods; legal status of trade unions; the strike; the boycott; the injunction. Types of governmental intervention.

Given in the Summer of 1943.

638. Labor Legislation. Three credit hours. Winter Quarter. Three class meetings each week. Miss Herbst.

State activity in relation to labor. The operation of protective legislation relating to child labor, wages, hours. Special consideration is given to the operation of the federal National Labor Relations Act and the Fair-Labor Standards Act. Reference is made to Ohio statutes and their administration.

639. Social Insurance. Three credit hours. Spring Quarter. Three class meetings each week. Mr. Bowers.

Efforts to guarantee to the worker security. Accident insurance; employers' and workmen's compensation; health hazards and health insurance. Old age insurance and pensions; unemployment and its prevention; unemployment insurance. Compulsory automobile insurance.

640. The International Organization of Labor. Three credit hours. Spring Quarter. Three class meetings each week. Miss Herbst.

American and foreign labor movements are viewed historically in relation to economic, political, and legal institutions. The purposes and problems of trade unionism, political activity, cooperation, and international organization of labor are included.

Not open to students who have credit for Economics 513.

643. Women in a War Economy. Three credit hours. Autumn Quarter. Three class meetings each week.

The role of women in the economic system and their responsibilities during a war period. Opportunities for participation in the war effort. An analysis is made of the industrial, social, legal, and economic problems confronting women.

645. Consumption Economics. Three credit hours. Winter Quarter. Three class meetings each week. Miss Herbst.

Consumption economics from the standpoint of the individual and of society; the consumption problem in the price system; variations and inequalities of income; price levels and the cost of living; influences determining consumer choice; standards of economy of consumption.

648. Public Utility Economics. Five credit hours. Autumn Quarter. Five class meetings each week. Mr. Kibler.

A course complementary to Economics 618, with special emphasis on local public utilities, including water, gas, electric light and power, telephone and telegraph, etc. The history and present status of regulation and the leading problems arising therefrom, including supervision of holding companies, valuation, reasonableness of rates, adequacy and economy of service, etc. Public ownership versus public regulation.

651. International Commercial Policies. Three credit hours. Spring Quarter. Three class meetings each week. Mr. Held.

The theory of international trade; historic policies; mercantilism; free trade and protection. A study of the tariff policy of the United States with a comparative study of the policies of other countries. International trade as affected by the World War and post war developments.

656. The Distribution of Wealth and Income. Three credit hours. Spring Quarter. Three class meetings each week. Mr. Hayes.

Analyses of the process by which wages, interest, rent, and profit are determined; proposals for altering same.

658-659. Population. Three credit hours. Two Quarters. 658, Autumn; 659, Winter. Three class meetings each week. Given in alternate years. Mr. Wolfe.

The growth and distribution of population. The relation of numbers to resources, productive capacity, standard of living, prosperity, and international economic problems. The dynamic aspects of population in relation to material and moral progress. Critical consideration of population theories and policies.

669. Socialism and Related Movements. Three credit hours. Autumn Quarter. Three class meetings each week. Mr. Hayes.

The developments of capitalism and protest movements related thereto such as utopian socialism, Marxism socialism, anarchism, syndicalism, and state socialism. Comparison of proposed schemes with capitalism in respect to the determination of the lines of production

to be followed, the maintenance of full employment, the encouragement of progress, and the distribution of income.

671. Contemporary Economic Systems. Three credit hours. Winter Quarter. Three class meetings each week. Mr. Hayes.

The economic aspects of communism in Russia, fascism in Italy, and national socialism in Germany. Comparison of these economic systems with capitalism in the United States and Great Britain.

673. Principles of Social Economy. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include ten hours of economics and ten hours of history, philosophy, political science, psychology, sociology or geography; or thirty hours in any combination of the subjects listed. Mr. Wolfe.

The intent of this course is to arrive at some insight into the meaning and criteria of ideal economy, not in its material and technological, but in its fundamental human aspects. Purposive economics in relation to fundamental human values. Fundamental values and instrumental values. The means-end relation and the principle of economy of means. Income as opportunity, and the economic criteria of distribution of opportunity. The conflict between efficiency, liberty, and the ideal use of resources, material and human. Democracy and authoritarianism in relation to economy. An economic interpretation of social conflict and social ethics.

679. Economics of a War Period. Three credit hours. Winter Quarter. Three class meetings each week. Mr. Salz.

The nature of modern war. Principles of war-economics, war-potential, allocations and priorities. Rationing and price-controls. War-budgets and inflation. Excess profits and wage policies. Problems of post-war reconstruction.

Given in the Summer of 1943.

706. Banking Systems: American and Foreign. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisits must include a course in money and banking or its equivalent.

This course continues and develops the work of Economics 520 by making a comparative study and analysis of the banking systems of the United States, Canada, and selected European countries. Particular attention is given to recent problems in the field of money and banking.

710-711-712. Statistical Analysis. Two credit hours. Three Quarters. 710, Autumn; 711, Winter; 712, Spring. General prerequisites must include four credit hours of statistics and permission of the instructor. Mr. Smart.

Analysis of frequency distributions, correlation and the analysis of variance. Sampling, the design of statistical inquiries and tests of significance as well as the control of the quality of product from the statistical point of view will be emphasized. The use of tabulating and mechanical equipment in handling statistical problems will be treated.

716-717-718. Public Control of Economic Processes. Two credit hours. Three Quarters. 716, Autumn; 717, Winter; 718, Spring. Mr. Kibler.

The transition from laissez-faire to governmental, economic control with emphasis on the changed conditions which have rendered competition either ineffective or inadvisable as a regulator of certain phases of the economy in the public interest. The course includes analyses and appraisals of theories, policies, and control measures instituted by the United States and other selected countries.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites must include good foundation courses of collegiate grade in the principles of economics, political science, psychology, European and American history.

801-802-803. History of Economic Thought. Three credit hours. Three Quarters. 801, Autumn; 802, Winter; 803, Spring. Three class meetings each week. Mr. Patton.

An account of the development of economic ideas and principles in the Western World with the purpose of showing how they were the outgrowth of the economic and political conditions of the times in which they originated.

Given in the Summer of 1943.

***804-*805-*806. Economic History of the United States.** Three credit hours. Three Quarters. 804, Autumn; 805, Winter; 806, Spring. Three class meetings each week. Alternates with Economics 812-813-814. Mr. Smart.

812-813-814. The Economic History of Western Europe. Two credit hours. Three Quarters. 812, Autumn; 813, Winter; 814, Spring. Two class meetings each week. Preferably preceded or accompanied by Economics 801-802-803. Alternates with Economics 804-805-806. Mr. Smart.

A general survey from the fall of the Roman Empire to the Great War. Especial attention is given to the interrelations between the economic institutions, the general culture, and the economic thought of the various periods. The development of modern capitalism. Economic background and social consequences of the Industrial Revolution. The economic causes and implications of modern European nationalism.

816-817-818. Modern Economic Theories and Theorists. Three credit hours. Three Quarters. 816, Autumn; 817, Winter; 818, Spring. Three class meetings each week. Alternates with Economics 871-872-873. Mr. Wolfe.

Critical consideration of the leading economists from J. S. Mill to the present. English and American classical and neo-classical writings, the Austrian School, and the more important continental theorists, including post-war and contemporary writers, both orthodox and unorthodox.

***825. Current Taxation Problems.** Two credit hours. Winter Quarter.

A critical analysis of the taxation problems now before the federal, state, and local governments.

863. Advanced Money. Three credit hours. Spring Quarter. Preferably preceded by a course in money and banking. Mr. Dice.

A study of the gold standard; the gold exchange standard; the role of money in the economic organization; the leading types of monetary theory; and the methods of stabilizing the price level.

864. Advanced Banking. Three credit hours. Winter Quarter. Three discussion periods each week. General prerequisites must include a course in money and banking. Mr. Dice.

The integration of the financial institutions; the theories of bank deposits; the theories of the elasticity of bank currency; the discount policy and the interest rate of central banks; the effectiveness of the different methods of regulating credit and business activities.
Given in the Summer of 1943.

***871-*872-*873. Problems in Contemporary Economic Theory.** Three credit hours. Three Quarters. 871, Autumn; 872, Winter; 873, Spring. Alternates with Economics 816-817-818. Mr. Wolfe.

(a) An examination of the assumptions and analytic techniques of current theoretical economics. Formal, empirical, and normative economics. Statics and dynamics. (b) Empirical techniques. (c) The aims, methods, and content of institutional economics. The relations among logic, ethics, law, history, psychology, and economics.

874. Labor and Industry. Two credit hours. Spring Quarter. Miss Herbst.

A seminar course on present-day problems confronting the wage-earner. The problems will be considered with special reference to the Trade Union Movement in this and other countries.

***875-*876. Problems of Capital Accumulation and Utilization.** Three credit hours. Two Quarters. 875, Winter; 876, Spring. Three class meetings each week. Given in alternate years. Mr. Wolfe.

An analysis of the doctrines of economists and other writers concerning the problems of capital accumulation and utilization with especial attention to economic "progress," oversaving, thrift, industrial depressions, inequality of wealth, and the export of capital.
Not open to students who have credit for Economics 868.

877. Social Insurance Problems. Two credit hours. Winter Quarter. Mr. Bowers.

A critical analysis of social insurance problems faced by the Federal and State governments, the place of social insurance in the economic system, with special reference to its preventive aspects and stabilizing possibilities; economic aspects of administration.

* Not given in 1943-1944.

*878. **Mathematical Economic Theory.** Three credit hours. Autumn Quarter. Given in alternate years. Mr. Bittermann.

885-886-887. **Philosophical Foundations of Economics.** Three credit hours. Three Quarters. 885, Autumn; 886, Winter; 887, Spring. Given in alternate years. Mr. Salz.

Philosophical and methodological foundations of economics. Analysis of the conception of Geisteswissenschaften. Fundamental assumptions. The problem of values. The relation of social to natural sciences. The development of Geisteswissenschaften in Europe. Controversial questions.

888-889-890. **Current Economic Literature.** One credit hour. Autumn, Winter, and Spring Quarters. Senior Staff members.

A seminar course surveying and analyzing the contributions of the technical journals during the year. Reading assignments according to the student's interest and field of specialization, conferences, reports and criticisms.

950. **Research in Economics.** Autumn, Winter, and Spring Quarters. Open by permission of the Committee on Graduate Work.

Qualified graduate students who wish to do research with the advice of members of the staff of the Department of Economics may register for this course.

Given in the Summer of 1943.

EDUCATION

Office, 120 Arps Hall

PROFESSORS EIKENBERRY, ALBERTY, ANDERSON, BERRY, BODE, CAHOON, ECKELBERRY, GOOD, HECK, HULLFISH, KLEIN, LANDSITTEL, LEWIS, RATHS, REEDER, SANDERSON, SEELY, SMITH, STONE, STREITZ, THARP, TWISS (EMERITUS), WARNER, AND ZIRBES, ASSOCIATE PROFESSORS BENNETT, FAWCETT, AND TYLER, ASSISTANT PROFESSORS EBERHART, HARDING, AND GRIFFIN, MISS WELLS

Departmental Committee on Graduate Work: A committee, including the Chairman of the department, is in charge of the graduate work of the Department.

Prerequisites for Graduate Work: 1. A student seeking to enter upon graduate work in the field of education shall hold a Bachelor's degree from an accredited institution of higher learning, and, (by official records or comprehensive examinations) shall show familiarity with certain areas of education to the extent that is required for appropriate standard certification to teach in the public schools of Ohio or another state having comparable standards. The areas in which familiarity should be exhibited ordinarily shall include the following: (a) Philosophy or Principles of Education; (b) History of Education; (c) Educational Psychology; (d) Methods of Teaching; (e) School Organization and Management. This does not necessarily mean that courses shall have been taken which bear titles corresponding exactly to the fields named above. In addition to the above requirement the student will present course credits for student teaching or provide evidence of one or more years of successful teaching experience.

2. Specific requirements to supplement the foregoing general prerequisites may be set in the various areas of specialization within the Department.

3. In cases which are exceptional by reason of the maturity, training, and experience of the student concerned, these prerequisites may be modified by the department, subject in each case, to the approval of the Dean of the Graduate School.

Areas of Specialization Within the Department: The following are the areas in which students may specialize for the degrees of Master of Arts or Doctor of Philosophy:

1. *For the Master's Degree:* Elementary education, secondary education, teaching one or more of the secondary school subjects or fields, superintendence, philosophy of education, industrial arts, industrial vocational education, history of education and/or comparative education, special education, guidance and personnel, adult education, and commercial education.

2. *For the Ph.D. Degree:* Each of the areas named above except the last two, and in addition, higher education, college teaching of education, and the curriculum.

The departmental committee on graduate work, in cooperation with advisory committees, may arrange in specific cases, on either the Master's or Doctor's level, for specializations not listed above, subject to the approval of the Dean of the Graduate School in each instance.

* Not given in 1943-1944.

Requirements for the Master's Degree: 1. *Course Requirements.* The minimum forty-five hours of graduate work for the degree must be selected in accordance with certain regulations of the Department. Copies of these regulations may be obtained at the departmental office.

2. *Requirement in Written English.* Each candidate is required to demonstrate ability to write clear and correct English.

3. *Examination Requirements.* Each candidate must take: (a) A diagnostic test covering areas of general professional competence; this will be given near the beginning of his graduate work for the purpose of guidance; (b) a departmental preliminary examination covering areas of general professional competence and conducted by a committee of the department. The examination should be taken during the second Quarter of work toward the Master's degree; (c) a written examination in his area of specialization, to be conducted by his adviser and at least one other staff member nominated by his adviser and approved by the committee on graduate work in education; (d) an oral defense of his thesis before a committee consisting of his adviser and at least one other staff member nominated by his adviser and approved by the departmental committee on graduate work.

4. *Bases of Recommendation for the Degree.* In making its recommendation concerning the granting of the Master's degree to any student, the examining committee considers his record in course work, his showing on examination, the reports of professors in whose classes he has been enrolled, the quality of his thesis, and any other available data. The Department reserves the right to withhold recommendation for the degree in cases involving moral delinquency, serious mental or emotional instability, active communicable disease of a serious character, or any other physical or mental condition which would render clearly undesirable the student's attempting to enter professional educational work.

Requirements for the Ph.D. Degree: 1. *Direction of the student's work for the doctorate.* At the beginning of a student's work for the doctorate a member of the staff is designated by the committee on graduate work in education as his tentative or temporary adviser. On nomination of the tentative adviser, an advisory committee for the student, consisting of a chairman and at least two other staff members, is appointed. It has the general direction of the student's work.

2. *The foreign-language requirement.* The student's advisory committee designates the method by which the student will meet the foreign language requirement.

3. *The departmental preliminary and the general examinations.* The departmental examination is conducted by the student's advisory committee. It consists of a written portion to be followed, at the option of the committee, by an oral portion. The written portion covers the areas designated by the advisory committee. The examination may be taken in any Quarter the student desires, providing that his advisory committee certifies that in its opinion he is prepared to take it. A "satisfactory" report on the examination indicates that in the opinion of the committee the student is prepared to take the general examination for admission to candidacy (provided also that he has satisfied the foreign language requirement of the Graduate School).

The general examination for admission to candidacy consists of a writtten and oral portion. The written portion covers the area or areas designated by the student's Advisory committee, and requires from six to ten hours. The examination may be taken during any Quarter the student desires, provided he is registered in the Graduate School, has satisfied the foreign language requirement, and has passed the departmental preliminary examination. The general examination is conducted by a committee appointed by the Dean of the Graduate School on nomination of the student's advisory committee. The examining committee ordinarily includes the members of the student's advisory committee.

The areas to be covered by the departmental preliminary and the general examinations and the weight to be given to each area are designated by the student's advisory committee. Not fewer than three nor more than six areas are designated for the two examinations. Of the areas designated, no fewer than three, including those covered in the general examination, are chosen from the areas listed above as suitable for specialization for the doctorate; the others may be within or without the Department of Education. The total number of hours of written examination is not less than twenty. No area designated is given a weight of more than fifty per cent of the total of the two examinations.

In deciding whether a student is to be recommended for admission to candidacy, the committee considers the same types of evidence as for recommendation for the Master's degree. The Department reserves the right to withhold recommendation for admission to candidacy (or for the degree) for the reasons mentioned above in connection with the Master's degree.

4. *Requirement in written English.* Each candidate is required to demonstrate ability to write clear and correct English.

5. *The dissertation.* The dissertation topic is selected by the student with the approval of the student's advisory committee. The members of this committee ordinarily constitute the committee appointed by the Dean of the Graduate School to evaluate the dissertation.

6. *The final oral examination.* The members of the committee to conduct the final oral examination are nominated to the Dean of the Graduate School by the student's advisory committee; ordinarily, this committee includes the members of the advisory committee.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

GENERAL AND BASIC

600. Minor Problems. Two to four credit hours. Autumn, Winter, and Spring Quarters. Students may, with the approval of their advisers, register for more than one section of Education 600 or for the same section two or more times.

By permission of the Chairman of the Department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under members of the Bureau staff.

(a) Business Education. Mr. Stone.
(c) Elementary Education. Miss Zirbes, Miss Streitz, Mr. Heck, Mr. Anderson, Mr. Harding.
(d) Guidance. Mr. Stone, Mr. Smith, Mr. Anderson, Mr. Heck, Mr. Bennett.
(e) Higher Education. Mr. Klein, Mr. Anderson, Mr. Hullfish.
(f) History of Education and Comparative Education. Mr. Good, Mr. Eckelberry.
(g) Industrial Arts Education. Mr. Warner, Mr. Smith.
(h) Industrial-Vocational Education. Mr. Stone, Mr. Warner, Mr. Smith.
(i) Philosophy of Education. Mr. Bode, Mr. Hullfish.
(j) Radio Education. Mr. Tyler.
(k) Secondary Education. Mr. Alberty, Mr. Eikenberry, Mr. Eckelberry.
(l) Special and Adult Education. Mr. Berry, Mr. Heck, Mr. Nisonger, Miss Rosebrook.
(m) Superintendency. Mr. Lewis, Mr. Reeder, Mr. Heck, Mr. Bennett.
(n) Teaching of English. Mr. Seely, Mr. Eberhart.
(o) Teaching of Foreign Languages. Mr. Tharp.
(p) Teaching of Mathematics. Mr. Fawcett.
(q) Teaching of Sciences. Mr. Cahoon.
(r) Teaching of Social Studies. Mr. Landsittel, Mr. Griffin.
(s) Visual Education. Mr. Dale.

Given in the Summer of 1943.

601. Radio in Education. Two credit hours. Winter Quarter. Mr. Tyler.

A consideration of the place of radio in modern teaching with particular attention to the techniques employed in its use in the various subjects in elementary and secondary schools. Opportunity for observation and individual experimentation.

Given in the Summer of 1943.

602. Visual Instruction. Three credit hours. Winter Quarter. Permission of the instructor must be obtained. The enrollment will be limited to forty-five students. Mr. Dale.

A consideration of the role of visual instruction in education; intensive study of the contribution of visual materials to educational objectives with especial attention to the research literature. Educational principles to be followed in the utilization of visual materials will be analyzed. Standards for evaluation will be critically examined.

Given in the Summer of 1943.

*606. Foundations of Education. Five credit hours. Autumn Quarter. This course is designed particularly for those beginning graduate study in the field of education.

This course is a basic course for graduate students in education. The materials consist of a survey of major social philosophies, their biological, psychological, and historical sources and their application in the continuous reorganization of educational agencies and procedures, including research.

Not open to students who have credit for Education 603.

†630. The Problems of Educational Planning in Ohio During the National Emergency. Two credit hours. Mr. Lewis and resident members of the University faculty will coordinate the course and integrate the contributions of visiting specialists.

A consideration of the place of education in emergency planning and of the problems of educational preparedness for post defense adjustments. Such problems as the following will be discussed: needed extensions of the school and other community agencies, relationships between the school and other community agencies, relationships between the school district

* Not given in 1943-1944.
† Not given during the academic year, 1943-1944.

and the state and federal government, means of financing education, and the maintenance of professional and public morale. Open to teachers, supervisors, administrators, and other educational employees.

Students in this course who wish to make special application of these principles to their own communities may register for Education 600.

Given in the Summer of 1943.

*645. The Library in the Modern School. Three credit hours.

A course designed primarily for teachers, supervisors, and administrators to acquaint them with the place of the school library in modern education. Objectives of school library service, integration of library and instruction, library standards, selection of personnel, housing and equipment of the library, costs of service, and broader concepts of library materials will be investigated.

Not open to students who have credit for Education 503.

NOTE: Attention is called to the service course (Psychology 680) offered for those majoring in Elementary or Secondary Education or the Superintendency.

PHILOSOPHY OF EDUCATION

607. Philosophy of Education. Three credit hours. One Quarter. Autumn, Winter, Spring. Open by permission of the instructor. Mr. Bode, Mr. Hullfish.

A consideration of the distinctive function or purpose of education in the social order and the bearing of this purpose on problems of organization and administration, the selection of subject matter, and classroom procedures.

Given in the Summer of 1943.

610. Conceptions of Mind in Educational Theory. Three credit hours. Autumn Quarter. Mr. Bode.

A study of the doctrines of mind that have exercised a determining influence upon educational theory and practice.

Given in the Summer of 1943.

611. The Thinking Process in Its Educational Bearings. Three credit hours. Winter Quarter. General prerequisites must include Education 610. Mr. Hullfish.

A study of the thinking process for the purpose of tracing its implications for educational theory and classroom practice.

Given in the Summer of 1943.

617. Modern Tendencies in Education. Three credit hours. Spring Quarter. Mr. Bode.

A discussion of current educational doctrines and controversies, in the light of their historic background and their philosophical implications.

620. Moral Ideals in Education. Three credit hours. Spring Quarter. Mr. Hullfish.

A consideration of types of moral ideals, of the relation of moral values to school subjects, and of the question of direct and systematic moral instruction in the schools.

Given in the Summer of 1943.

624. Social Education. Three credit hours. Winter Quarter. Lectures and discussions. Mr. Cook.

Case studies of community schools; school uses of community resources in curriculum and public interpretation; problems in adapting school to community; the teacher's community contacts.

HISTORY OF EDUCATION AND COMPARATIVE EDUCATION

632. The History of Modern Education. Five credit hours. One Quarter. Autumn, Winter, Spring. Mr. Good.

Not open to students who have credit for Education 507.

Given in the Summer of 1943.

*633-*634. Historical and Comparative Study of Secondary Education. 633, Autumn Quarter, two credit hours; 634, Winter Quarter, three credit hours. General prerequisites for 633 must include twenty hours in education and

* Not given in 1943-1944.

allied subjects including ten hours in secondary education and five hours in history of education; for 634, Education 633.

A survey of the development of secondary education with intensive treatment of the American academy and high school in relation to social and political conditions and philosophies, and in comparison with present secondary schools in Europe.

It is recommended that students do not register for Education 633, unless they expect to register also for Education 634.

635. The Evolution of Educational Thought. Five credit hours. Spring Quarter. Given in alternate years. Mr. Good.

A study from the sources of the great philosophies of education in relation to their times; and an evaluation of their influence on present educational thought and practice. The thought of the Greek, Roman, Renaissance, and the modern democratic and industrial thinkers will be studied.

Given in the Summer of 1943.

***636. Evolution of American Education.** Five credit hours. General prerequisites must include Education 632 or its equivalent. Mr. Good.

After a brief survey of the colonial beginnings, emphasis will be laid upon the early national period, the expansion after the Civil War, and the reconstruction of American education since 1900. Study of original sources. The evolution of elementary, secondary, and higher education.

639. Great Teachers. Two credit hours. Winter Quarter. Two one-hour lectures each week. Mr. Good.

Study of the times, personalities, and work of several eminent teachers: Socrates, Plato, Jesus, Quintilian, Agassiz, Arnold and others.

Given in the Summer of 1943.

***641. The History and Theory of Vocational Education.** Three credit hours. Spring Quarter. One two-hour meeting each week. Given in alternate years. Mr. Stone and others.

The history and theory of activities related to agriculture, business, industry, and home making as a part of education, and their relation to the general theory and practice of education.

***642. History of Physical and Health Education.** Three credit hours. Spring Quarter. Given in alternate years.

An historical survey of physical and health education beginning with the physical education of ancient Greece, with special emphasis on recent and contemporary developments in Europe and America.

ELEMENTARY EDUCATION

651. Major Sequence in Childhood Education. Three credit hours. Autumn Quarter. Miss Streitz.

A comprehensive survey of the educational needs of children between infancy and adolescence, with particular reference to the adjustment of learning experiences, materials, and procedures to successive levels of child development.

Given in the Summer of 1943.

652. Major Sequence in Childhood Education (Continued). Three credit hours. Winter Quarter. Miss Zirbes.

A critical study of the changing elementary school from the standpoint of evaluation: a consideration of the social and psychological implications of current issues involved in the reconstruction of elementary education.

Given in the Summer of 1943.

653. Major Sequence in Elementary Education. Three credit hours. Winter Quarter. Mr. Harding.

A graduate course in which superintendents, principals, supervisors, and others interested in leadership in elementary education will study the practical problems of school and curriculum organization and procedure. This will include study of the demonstration school in action.

Given in the Summer of 1943.

655. Industrial Arts for Teachers in Elementary Schools. Three credit hours. Winter Quarter. Mr. Warner.

First-hand study of typical modern industries as one means of developing understanding

* Not given in 1943-1944.

and insight into social and economic backgrounds and their implications. Criterion characterization of industrial arts in the program of elementary education. Selection, study, and development of many typical problems with reference to the various levels of the elementary school, in addition to planning the physical setting required.

Given in the Summer of 1943.

*658. **Problems in the Direction and Supervision of Elementary Teacher Education.** Three credit hours. Spring Quarter. Miss Zirbes.

An intensive study of the problems confronting the director of student teaching, the supervisors of student teachers and critic teachers. Special attention is given to the development of the teacher as a person, enriched content courses, reorganization of methods courses, have intimate relation of theory and practice, widening the scope of student teaching, and creative supervision of student teaching.

*661. **Problems of Elementary Teachers in Service.** Two credit hours. Autumn Quarter. Participation in special projects and investigations with reports. Open to graduate students by permission of the instructor and to principals and teachers in service.

The work will center about ways and means of improving instruction through actual attack on selected classroom problems.

†662. **Laboratory Problems in Child Development.** Three credit hours. Winter Quarter. General prerequisites must include Education 651-652. Miss Zirbes.

Workshop in Elementary Education. Registration in the course is restricted to students with professional experience and is subject to instructor's approval.

Given in the Summer of 1943.

664. **Health Education for Teachers.** Three credit hours. Spring Quarter. Three lecture periods each week. Mr. Oberteuffer.

A consideration of the teacher's responsibility for practicing and maintaining high standards of personal hygiene and health, and a first-hand study of the environmental and social conditions and problems of community health.

Given in the Summer of 1943.

SECONDARY EDUCATION

670. **Teaching Literature in the High School.** Five credit hours. One Quarter. Autumn, Winter, Spring. Five lectures each week: observations. Mr. Seely.

Emphasis will fall upon the selection of suitable poetry, drama, prose-fiction, etc., for junior and senior high-school pupils; developing methods for their presentation and study; and suggesting means for correlating the work in literature with the other high-school studies.

Given in the Summer of 1943.

671. **Teaching Composition in High School.** Five credit hours. One Quarter. Autumn, Winter, Spring. Five lectures each week: observations. Mr. Seely.

This course will be devoted to the discussion of the methods of teaching grammar and composition, and to means of developing originality, imagination, and individuality in the oral and written expression of high-school pupils.

Given in the Summer of 1943.

*672. **Teaching Composition in High School.** Three credit hours. Lectures, conferences, readings. This course is the more advanced part of Education 671 (offered during the year). It may be elected by teachers and other persons of maturity who are not required to elect all of Education 671. (Students who will do practice teaching in English may not elect this course since they will elect Education 671 during the Autumn or Spring Quarter.) Mr. Seely.

This course will be devoted to the materials and methods of teaching the language fundamentals, oral composition, and written composition.

*674. **The Supervision of Journalism in Secondary Schools.** Three credit hours.

This course is designed for persons who have been teaching journalism in secondary schools, or who act as faculty advisers for school newspapers, magazines, or annuals. It includes a

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

general survey of the editorial, publishing, and mechanical phases of school newspapers and other publications with emphasis on those aspects which are of particular value to teachers.

Open to students registered in th College of Education and to graduate students.

Not open to students who have credit for Education 546.

675. Spoken English: Teachers' Course. Three credit hours. Winter Quarter. Miss Sanderson.

Classroom lectures and discussion designed to assist teachers of public speaking and debating in secondary schools. The nature of speech training in the secondary schools. Definite suggestions on the following: how to prepare students for debating and speaking contests; speech delivery; speech composition; classroom reports. This is not a course in speech practice.

Given in the Summer of 1943.

677. The Teaching of the Social Studies I. Five credit hours. One Quarter. Autumn, Winter, Spring. Five lectures each week; observations. Mr. Landsittel, Mr. Griffin.

An examination of different theories of the role of social studies materials within the learning process, with particular attention to the impact upon the beliefs, attitudes, and values of secondary school students. Illustrative materials will be drawn primarily from history, economics, and sociology, with some attention to geography, anthropology, and political science. Special emphasis is given to the use of social studies materials in clarifying the contrast between authoritarianism and democracy, to the function of information within the reflective process, and to the possible contributions of the social studies teacher within the core curriculum.

Given in the Summer of 1943.

678. The Teaching of the Social Studies II. Three credit hours. One Quarter. Autumn, Winter, Spring. Lectures, discussions, observations. Mr. Griffin.

A continuation of Education 677. The purpose of the course is further to exemplify concretely the principles developed in Education 677, and to help the student to develop enriching materials specifically related to the class or classes he is teaching. Self-directing group work under proper leadership is the type of classroom procedure throughout. Observation of teaching in secondary schools is involved.

Given in the Summer of 1943.

680. Science Materials for Junior and Senior High Schools. Three credit hours. Winter Quarter. Lectures, readings, problem assignments and participation in the University School science classes. General prerequisites must include a major or minor in science and Education 684, or the equivalent. Mr. Cahoon and science staff of the University School.

Planned to give teachers of junior and senior high school science contact with important teaching materials and sources. Emphasis will be placed upon such topics as planning and use of materials, key sources, visual and audio aids, materials for teaching scientific thinking and tests and evaluation instruments. Students will be expected to collect, construct and organize materials for use in their own science classes.

Not open to students who have credit for Education 538.

Given in the Summer of 1943.

681. Laboratory Practicum for Teachers of Science. Two to five credit hours. Autumn Quarter. Demonstrations, laboratory work, construction of apparatus, participation in science classes in the University School. General prerequisites must include Education 683 or 684 or equivalent, and major or minor in one or more of the following: physics, chemistry, physics-chemistry, general science, biology. Mr. Cahoon and the science staff of the University School.

Students will have experience in working with such techniques as glass blowing, wood and metal working, chemical techniques, electrical circuits and devices, and photographic and visual aids as related to apparatus materials and tools used in science courses in secondary and elementary schools. Students will make use of these techniques in assembling and constructing demonstration and laboratory apparatus for use in various science courses. Techniques and projects will be adapted to the needs and interests of individual students or teachers.

Education 681 may be taken more than once provided the total credit received for Education 681 and 539 does not exceed five Quarter hours.

Given in the Summer of 1943.

†682. **Field Laboratory in Conservation Education.** Six to nine credit hours. General prerequisites must include twenty hours in Education, including Education 684 or equivalent or major in Wildlife Conservation.

Primarily designed for teachers in elementary and secondary schools and is conducted from Tar Hollow Camp near Chillicothe, Ohio. It will employ the entire time of the student. Field observations, laboratory demonstration, group discussions and lectures concerning curriculum and methods of teaching in the fields of conservation of soils, wild life, and other resources, will be conducted.

Given in the Summer of 1943.

683. **The Teaching of Biology.** Three credit hours. Spring Quarter. Three recitations each week; observations. Mr. Wareham, Mr. D. F. Miller.

The work will include lectures and demonstrations with discussion of the best methods of presenting botany, zoology, and biology to high school students.

684. **The Teaching of General and Physical Science.** Three credit hours. Autumn Quarter. Lectures, reading, observations and participation in the University School science classes. Mr. Cahoon and science staff of University School.

A study of the problems and techniques in the teaching of general and physical science courses in junior and senior high schools. Objectives, planning, use of demonstrations and laboratory experiments, texts and reference materials, pupil projects, trips, teaching and evaluating scientific thinking, directed study, visual aids, professional literature.

Given in the Summer of 1943.

686. **The Curriculum in Schools of Nursing.** Three credit hours. Spring Quarter. Miss McKenna, Miss Kneebone.

Consideration is given to the philosophy and purpose of the curriculum for Schools of Nursing as set forth in *A Curriculum Guide for Schools of Nursing.*

A study of the interrelation between theory and practice; length and placement of courses; problems pertaining to the planning of the class schedule in the light of given known situations; responsibilities of teaching personnel; class load and physical facilities, such as classrooms, laboratories and library.

687. **The Teaching of Mathematics in Secondary Schools.** Three credit hours. Autumn Quarter. Lectures, readings, observations and participation in the mathematics classes of the University School. Mr. Fawcett and the mathematics staff of the University School.

A consideration of mathematical concepts, skills, and appreciations important for all pupils in the secondary school and related teaching procedures. Purposes and outcomes; changing emphases and trends in mathematics teaching; planning; directed study; texts and reference materials; testing; professional literature. Selected important topics will be presented as illustrative of modern teaching methods adaptable to the secondary school.

Given in the Summer of 1943.

688. **Mathematics Materials for Junior and Senior High Schools.** Three credit hours. Winter Quarter. Lectures, problem assignments, readings, and participation in University School mathematics classes. General prerequisites must include twenty hours of mathematics and twenty hours in psychology and education. Education 687 must be included in the prerequisites or taken concurrently with permission of the instructor. Mr. Fawcett and mathematics staff of University School.

Planned to give teachers and prospective teachers of mathematics an enlarged concept of and first-hand experience with important materials and sources useful in providing worthwhile experience for pupils in secondary schools. Topics include the development and use of important concepts in mathematics, key sources of materials, tests, and evaluation instruments. Students will be expected to collect, construct and organize materials for use in their own mathematics classes.

Not open to students who have credit for Education 545.

Given in the Summer of 1943.

689. **Field and Laboratory Work for Teachers of Mathematics.** Three credit hours. Autumn Quarter. Demonstrations, field work, projects, readings, laboratory work and participation in University School mathematics classes. General prerequisites must include a major or minor in mathematics and

† Not given during the academic year, 1943-1944.

Education 687 or the approval of the instructor. Mr. Fawcett and mathematics staff of the University School.

Actual experience with instruments and apparatus in field and laboratory work suitable for boys and girls in the junior and senior high schools. The use of devices and apparatus including the slide rule, the plane table, the alidade, the transit, the angle mirror, the sextant, the hypsometer and clinometer for teaching concepts and skills needed in elementary surveying and mapping. Field and laboratory work and demonstrations will be carried out illustrative of teaching procedures applicable to secondary school classes.

Not open to students who have credit for Education 544.

Given in the Summer of 1943.

690. The Teaching of German. Three credit hours. Winter Quarter. Three recitations each week: observations. Mr. Kramer.

Values. Critical study of objectives and methods. Textbook selection. Classroom procedures. Readings, discussions, and reports.

692. Methods and Techniques of Teaching Romance Languages. Five or seven credit hours. Autumn Quarter. Five meetings each week, combined and sectional: observations. Mr. Tharp.

Lectures, readings, discussions and conferences.

Values. Objectives. Demonstrations and lectures on methods of teaching reading, grammar and pronunciation. Textbook analysis. Professional advancement. Examinations and marking. Eight observations of high school classes required.

Sections. Techniques of instruction. During the fourth to ninth weeks inclusive the class will meet four days a week in sections according to subject. The work of each section carries two hours of credit, and students may enroll in any sections for which they possess the prerequisites.

Section A. French. Mr. Tharp.

Section B. Spanish. Mr. Tharp.

Lesson plans. Problems of presentation in the reading lesson, grammar, pronunciation Construction of teaching materials. Choice of course content. Evaluation of classroom procedures.

Given in the Summer of 1943.

694. The Teaching of Latin. Three credit hours. Spring Quarter. Three recitations each week: observations. Mr. Hough.

Values. Teachers' equipment, objectives and methods. Classroom procedures. Lectures and assigned readings.

Given in the Summer of 1943.

696. The Teaching of Mechanical Drawing I. Three credit hours. Autumn Quarter. One lecture and seven hours of laboratory each week: observations. Mr. Grimes.

Objectives and methods in teaching the language of graphics. Reading, visualizing, translating. Writing, freehand and with instruments. Theory of shape description, orthographic and pictorial projection. Theory of size description. Intersections and developments. Lettering.

697. The Teaching of Mechanical Drawing II. Three credit hours. Winter Quarter. One lecture and seven hours of laboratory each week: observations. General prerequisites must include Education 696. Mr. Grimes.

Lettering in design. Bookplates. Heraldry in design. Methods of graphic reproduction. Planning a secondary school course, content, arrangement, methods of presentation, standards, examinations and grading. Drawing room and office equipment.

698. The Teaching of Mechanical Drawing IIa. Three credit hours. Spring Quarter. One lecture and two three-hour laboratory periods each week. Observations. General prerequisites must include an elementary course in drawing. Mr. Philby.

A study of objectives and methods. Planning a secondary school course, content, arrangement, demonstration methods and equipment, design of problems, examinations and grading. Modeling. Blackboard technique. Graphic reproduction. Correlation with other subjects.

699. Extra-curricular Activities of Secondary Schools. Three credit hours. Spring Quarter. Mr. Eikenberry.

The principles, organization, administration and supervision of extra-curricular activities. Consideration will be given to home-room activities, pupil participation in school government, assemblies, clubs, publications, debating and dramatics, athletics, honor societies, social activities, control of participation in activities, and financial administration of activities.

Given in the Summer of 1943.

701. Major Course in Secondary Education I. Five credit hours. Autumn Quarter. This course is required of all graduate students whose field of specialization is secondary education. Mr. Eikenberry.

A comprehensive survey of secondary education.

Given in the Summer of 1943.

702. Major Course in Secondary Education II. Five credit hours. Winter Quarter. This course is required of all students whose field of specialization is secondary education. Mr. Alberty.

A continuation of Education 701.

Given in the Summer of 1943.

704. Laboratory Study in Secondary Education. Three credit hours. Autumn Quarter. Mr. Gilchrist and University School staff.

A graduate course in which secondary school principals, supervisors, superintendents and others interested in leadership in secondary education will study the demonstration school in action with the advantage of planned guidance and interpretation, contacts, and conferences with the staff. In addition to the general problems of the course, there will be opportunities for students to select individual topics for special study, and to consider the bearings of education transition on their own work in the field.

***706. Problems of the Supervising Teacher in Secondary School Science.** Four credit hours. Winter Quarter. Lectures, student reports, laboratory. General prerequisites must include teaching experience, Education 684, and permission of the instructor. Mr. Cahoon.

Planned for teachers who are working with student teachers in their classes, or who expect to work with student teachers, and for those concerned with the supervision of teacher training programs in the science area. Objectives, curricula, recent trends, planning "lessons" and pupil experiences, techniques, classroom management, sources of teaching aids, evaluation of teaching, professional literature.

INDUSTRIAL ARTS

714. Selection and Organization of Subject Matter in Industrial Education. Three credit hours. Spring Quarter. Three recitation periods each week. Mr. Smith.

Principles and practice in defining specific area and course objectives and their relationship to the objectives of general education. General and specific criteria and controls determining the selection of subject matter and activities. Techniques of analysis applied to various industrial activities for the selection of facts and activities conducive to acquisition of desirable knowledge, skills, and behavior; and the organization of such materials into integrated courses of study and formulation of teaching plans.

Given in the Summer of 1943.

715. Laboratory Planning and Equipment Selection in Industrial Arts. Three credit hours. Winter Quarter. Seven periods each week for lecture and laboratory. Permission of the instructor required. Mr. Warner.

Analysis of problems and standards involved in planning rooms and practice in the selection, design, location, installation, and care of equipment in various high school industrial arts laboratories or vocational shops.

BUSINESS EDUCATION

721. Fundamental Principles of Teaching Business Subjects. Three credit hours. One Quarter. Autumn and Winter. Miss Wells.

A basic course in fundamental principles of teaching the business subjects. This course will orient the teachers in the entire field of business teaching in secondary schools and provide the background necessary for specialized courses 725 and 726.

Given in the Summer of 1943.

†722. Principles of Business Education. Three credit hours. Autumn Quarter. Mr. Stone.

For teachers of business subjects in the junior or senior high schools. Meaning, purpose, and scope of business education in secondary schools. Importance of and procedure in making occupational surveys in the field of business education.

Given in the Summer of 1943.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

*724. Administration and Supervision of Business Education. Three credit hours. Spring Quarter. Mr. Stone.

A course designed for administrators and supervisors of business education in the junior and senior high school. Courses of study: laboratory facilities, selection and improvement of teachers in service; and other major executive problems.

*725. Selecting and Teaching Junior High School Business Subjects. Three credit hours. Education 721 must be included in the general prerequisites or taken concurrently.

A professional course for teachers of business arts (sometimes designated as general business science or junior business training) in junior high school for major purposes of exploration, guidance, and fundamentals of consumer business education. Teaching plans and observation of classroom procedures.

†726. Selecting and Teaching Senior High School Business Subjects. Two to four credit hours. Education 721 must be included in the general prerequisites or taken concurrently.

A professional course for teachers of senior, technical or vocational business high school business subjects, including shorthand, typewriting, business English, office practice, bookkeeping, salesmanship, business law, business geography, buiness arithmetic, etc. Teaching plans and observation of classroom procedures.

Given in the Summer of 1943.

SUPERINTENDENCY

727. Introduction to School Administration. Five credit hours. Autumn Quarter. Required of graduate students preparing for school executive positions. Mr. Reeder.

Designed to give an overview of the organization and administration of education in the United States, and especially designed for persons who expect to become school executives. The following topics, among others, are discussed: federal, state, and local administrative organization for education; the function of school administration; finance and business management; the plant; the teaching corps; the pupils; the curriculum; textbooks and libraries; and records, reports, and public relations

Agencies and instruments in school government. Development of school codes, rules, and regulations. Relation of rules and regulations to philosophy of administration. Assigned readings, investigations, and reports.

Given in the Summer of 1943.

*729. Administration of Rural and Village Schools. Three credit hours. Winter Quarter. Three lectures each week. Assigned readings, investigations and reports. Education 727 must be included in the general prerequisites or taken concurrently.

An analysis of the administrative duties of the chief school administrator of consolidated and village schools. This course places particular emphasis on problems of transportation, methods of adjustment for small enrollment and other problems peculiar to rural and village schools.

735. Business Administration of Schools. Two credit hours. Winter Quarter. Three lectures each week. Assigned readings, investigations and reports. Education 727 must be included in the general prerequisites or taken concurrently. Mr. Reeder.

Function of business administration in the schools; administrative relationships; personnel of the business department; making the budget; procuring revenue; financial accounting; planning and constructing a building; architectural service; selecting and purchasing building sites; financial capital outlays; use of buildings; maintenance of the plant; the janitor; insurance of property; taking the inventory; school supplies; payroll procedure; school transportation.

Given in the Summer of 1943.

738. Administration of Pupil Personnel. Three credit hours. Spring Quarter. Three lectures each week. Assigned readings, investigations and reports. Education 727 must be included in the general prerequisites or taken concurrently.

Compulsory education laws and working certificates of Ohio; main requirements in other states. Census information it should secure, its use, legal requirements in different states. Attendance—organization of departments, amount and causes of non-attendance, devices to improve

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

attendance. School record systems—forms used, items recorded, and uses. Reporting systems—need of uniformity in recording and reporting systems. Age-grade-progress studies. Elimination, grading and promotion. Classification. Definition of terminology. Visiting teacher. Marking systems.

Given in the Summer of 1943.

740. Public School Relations. Two credit hours. Autumn Quarter. Education 727 must be included in the general prerequisites or taken concurrently. Mr. Reeder.

Emphasizes the function of public relations in school administration and the means for securing desirable public relations. The following topics, among others, are discussed: the aims and criteria for desirable public relations; the superintendent and the board of education in the school-relations programs; American Education Week; commencement as a school-relations agency; and organizing and conducting a publicity campaign.

Given in the Summer of 1943.

742. Legal Aspects of School Administration. Three credit hours. Spring Quarter. Three lectures each week. Assigned readings, investigations and reports. Education 727 must be included in the general prerequisites or taken concurrently.

A study of the laws and judicial decisions of various states, relating to education, in order to discover the legal principles involved. Major topics; authority and responsibility of teachers; rights, privileges, and responsibilities of students; teachers' contracts and pensions; legal and illegal use of school property; contractural capacity and liability of public school officials; school boundaries and districts; taxation; legal aspects of the curriculum; expenditures of school money. Primarily for supervisory and administrative officials.

*744. Administration of School Retirement and Pension Systems. One credit hour.

A general introductory treatment of the problems involved in creating and maintaining an adequate retirement system for the school employees of the state.

*746. Administration of School Libraries. Two credit hours. Four lectures each week. Assigned readings and reports.

Designed to meet the needs of school librarians and general administrative school officers. Principal topics: history and development of the school library; its place in educational systems; standards and state regulations; rooms, equipment, and budgets; selection, acquisition, and care of books; publicity and cooperation with other agencies; instruction in the use of books, relation of librarian to teachers and school officials.

GUIDANCE

750. Fundamentals of Guidance. Three credit hours. Autumn Quarter. Mr. Stone.

A basic but advanced course for all students desiring a comprehensive knowledge of the history, theory and practice of guidance. Especially for graduate students desiring to specialize in this field. The course considers the aims, materials, techniques, and research instruments of all major divisions of guidance service.

Given in the Summer of 1943.

751. Supervised Practice in Counseling. Three credit hours. Autumn Quarter. One two-hour recitation and discussion period and two hours laboratory each week. Lectures, reports, demonstrations, and laboratory practice. General prerequisites must include Education 750 or Psychology 640, and permission of the instructor. Given in alternate years. Mr. Smith, Mr. Love.

Consideration of counseling problems at different school levels including out-of-school youth. Studies of counseling techniques and aids. Practice in counseling with young people, parents, class and homeroom teachers, visiting teachers, administrative officers, school physicians, psychologists, psychometrists, psychiatrists, employers, and others. Of interest to those preparing to counsel with youth.

Given in the Summer of 1943.

752. Guidance through Social-Economic Studies. Five credit hours. Spring Quarter. General prerequisites must include Education 750, or permission of the instuctor. Mr. Stone.

This course is organized with particular reference to the needs of school advisers and teachers of social-economic (vocational) studies for major purposes of guidance.

Given in the Summer of 1943.

* Not given in 1943-1944.

754. The Administration of Guidance Programs. Three credit hours. Spring Quarter. General prerequisites must include Education 750.

Designed for school superintendents and high school principals and other executive officers in junior and senior high schools and junior colleges. Critical examination of the organization and administration of guidance programs in large and small school systems; the development of guidance programs for the school systems represented by the class membership.

755. Survey of Guidance Techniques. Three credit hours. Spring Quarter. General prerequisites must include Education 750 or its equivalent. Mr. Stone.

An overview of the various patterns and techniques of guidance procedure. Of interest not only to prospective specialists in guidance, but designed also for all who want a comprehensive survey of this field. Studies are made of requirements and opportunities for preparation in various lines of guidance specialization.

Given in the Summer of 1943.

756. School and Community Resources for Guidance. Four credit hours. Winter Quarter. General prerequisites must include Education 750 or its equivalent. Mr. Heck.

A study of (a) organization and administration of school systems and school communities with particular reference to the needs of guidance workers, and (b) information needed by guidance workers concerning educational opportunities available to high school students and graduates. Emphasis will be placed upon the functional relation of the guidance worker to different types and concepts of school organization, upon information concerning in-school and out-of-school educational opportunities and choices at all levels, and upon teaching pupils how to evaluate for themselves in-school and out-of-school opportunities and choices.

SPECIAL AND ADULT EDUCATION

764. Supervised Teaching in Special Classes. Five credit hours. Spring Quarter. This course is given only upon special request. Mr. Berry.

Practice teaching for qualified students in classes for the mentally retarded, for behavior problem children, for the defective in speech, or for the deaf and the hard of hearing.

Students will be expected to devote one-third of their time, under the supervision of the University instructor in charge, to this course.

Given in the Summer of 1943.

†765. Principles and Methods of Teaching the Mentally Retarded. Three credit hours. Winter Quarter. Mr. Berry.

A critical study of the various methods which are used in teaching the mentally retarded. In connection with this course, opportunity for practice teaching mentally retarded children will be provided for students desiring it.

Given in the Summer of 1943.

766. Principles and Methods of Teaching Behavior Problem Children. Three credit hours. Winter Quarter. Mr. Berry.

A critical study of principles and methods used in the adjustment of behavior problem children

Given in the Summer of 1943.

767. The Education of Exceptional Children. Three credit hours. Spring Quarter. Three lectures each week. Assigned readings, reports, and field trips. General prerequisites must include Education 727 or permission of the instructor in charge must be obtained. Mr. Heck.

History and development of special schools and classes; types defined; place in education; state encouragement and regulations; types of control; internal government; buildings and rooms; equipment; costs, teacher-training, experience, salaries; selection of other employees; characteristics of children; principles governing admittance, retention, and withdrawal; curriculum—academic, industrial, extra-curricular; methods of follow-up, etc.

Given in the Summer of 1943.

770. Adult Education. Three credit hours. Winter Quarter. Mr. Nisonger.

A study of the nature, extent, and significance of adult education. Consideration of the psychological characteristics of the adult, influence of social and economic factors on adult needs, history and types of adult education, present trends, future development.

Given in the Summer of 1943.

NOTE: For additional courses in special and adult education, see the Bureau of Special and Adult Education, page 69.

† Not given during the academic year, 1943-1944.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45, also on page 106.

SEMINARS

800. Seminars in Education. Two to five credit hours. Autumn, Winter, and Spring Quarters. Students may with the approval of their advisers register for more than one section of 800 or for the same section two or more times.

†(a) Business Education. Mr. Stone.
(c) Elementary Education. Winter Quarter. Miss Zirbes.
†(d) Guidance. Mr. Stone.
(f) History of Education and Comparative Education. Winter Quarter. Mr. Good.
(g) Industrial Arts Education. Winter Quarter. Mr. Warner.
(i) Philosophy of Education. Winter and Spring Quarters. Mr. Hullfish, Mr. Bode.
(k) Secondary Education. Autumn, Winter, and Spring Quarters. Mr. Eikenberry, Mr. Alberty.
(l) Special and Adult Education. Spring Quarter. Mr. Berry.
(m) Superintendency. Autumn, Winter and Spring Quarters. Mr. Lewis, Mr. Reeder.
†(o) Teaching of Foreign Languages.
(p) Teaching of Mathematics. Winter Quarter. Mr. Fawcett.
(q) Teaching of Sciences. Winter Quarter. Mr. Cahoon.
(r) Teaching of Social Studies. Autumn and Spring Quarters. Mr. Griffin.
Given in the Summer of 1943.

RESEARCH

950. Research in Education. Autumn, Winter, and Spring Quarters. Students may, with the approval of their advisers, register for more than one section of 950 or for the same section two or more times.

By permission of the Chairman of the Department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under members of the Bureau staff.

(a) Business Education. Mr. Stone.
(b) Curriculum Techniques.
(c) Elementary Education. Miss Streitz, Miss Zirbes, Mr. Harding.
(d) Guidance. Mr. Stone, Mr. Warner, Mr. Smith, Mr. Anderson, Mr. Heck.
(e) Higher Education. Mr. Klein, Mr. Hullfish, Mr. Anderson.
(f) History of Education and Comparative Education. Mr. Good, Mr. Eckelberry.
(g) Industrial Arts Education. Mr. Warner, Mr. Smith.
(h) Industrial-Vocational Education. Mr. Stone, Mr. Warner, Mr. Smith.
(i) Philosophy of Education. Mr. Bode, Mr. Hullfish.
(k) Secondary Education. Mr Alberty, Mr. Eikenberry, Mr. Eckelberry.
(l) Special and Adult Education. Mr. Berry, Mr. Heck, Mr. Nisonger.
(m) Superintendency. Mr. Lewis, Mr. Reeder, Mr. Heck, Mr. Bennett.
(n) Teaching of English. Mr. Seely, Mr. Eberhart.
(o) Teaching of Foreign Languages. Mr. Tharp.
(p) Teaching of Mathematics. Mr. Fawcett.
(q) Teaching of Sciences. Mr. Cahoon.
(r) Teaching of Social Studies. Mr. Landsittel, Mr. Griffin.
Given in the Summer of 1943.

GENERAL AND BASIC

802. The Preparation of Theses and Other Scientific Reports. Three credit hours. Winter Quarter. Open with permission of the instructor. General prerequisites must include Psychology 608 or equivalent. Mr. Reeder.

Emphasizes methods of research with special emphasis upon the preparation of theses. The following topics, among others, are treated: types of research; criteria for selecting and planning the problem; preparing the working and the final bibliographies; the securing of data; the organization, presentation, and interpretation of material; the form of citations, and the preparation of statistical tables and illustrations.

804. Educational Experimentation. Five credit hours. Spring Quarter. One two and one-half class hour meeting and one laboratory period of two hours each week to be arranged. Mr. Raths.

A consideration of significant aspects of the changing educational situation with particular reference to their implications for research. Methods of investigation and techniques of experi-

† Not given during the academic year, 1943-1944.

mentation applicable to the evaluation of current trends in elementary, secondary and higher education.

Given in the Summer of 1943.

*806. Techniques of Curriculum Construction. Three to five credit hours. Autumn Quarter. Open to students who have completed one year of graduate work in education.

This course deals with those techniques of curriculum construction which are used in the assembling of raw materials for the curriculum; the techniques for the determination of objectives; activity, trait, and difficulty analysis; the evaluation of activities; sampling, interviewing; and other techniques connected with the collection of raw material.

HISTORY OF EDUCATION AND COMPARATIVE EDUCATION

*814. Comparative Education. Five credit hours. Winter Quarter. Lectures and research. General prerequisites must include ten hours in the history of education.

A survey of the present school systems of selected countries such as England, France, Germany, Russia, Canada, Argentine Republic, Australia, Denmark in comparison with the United States; and the study of topics such as the relation of national and local government to education; the sources of school support; the preparation of teachers; the methods and agencies of adult education.

ELEMENTARY EDUCATION

824. Curriculum Problems in Elementary Education. Three credit hours. Autumn Quarter. General prerequisites must include Education 651-652. Miss Streitz.

A critical study of the reorganization, construction, and administration of the elementary school curriculum in the light of modern educational principles and objectives, the data contributed by research and the best current practices found throughout the country. Special attention will be given to organization of staff for curriculum study, to the basic issues in realizing a sound curriculum and to the installation, adaptation and administration of the revised curriculum.

Given in the Summer of 1943.

825. Elementary School Administration and Supervision. Three credit hours. Winter Quarter. General prerequisites must include Education 651-652 or permission of the instructor. Miss Streitz.

A critical analysis of current practice in the organization, administration, and supervision of the elementary school. Formulation of guiding principles and effective program, practical implications of creative democratic leadership in efficient management, in the diagnosis of teaching, in the professional development of personnel, in the creative use of school and community activities, and in the broader public and professional relations of the school.

Given in the Summer of 1943.

826. Practice in Supervision. Three credit hours. Spring Quarter. Open only by permission of the instructor. Miss Zirbes.

Typical school problems will be used to provide practice in the techniques of supervisory service. Emphasis will be placed on the application of principles of supervision to actual classroom situations.

Given in the Summer of 1943.

SECONDARY EDUCATION

829. High School Administration and Supervision I. Five credit hours. Winter Quarter. General prerequisites must include Education 701 and 702. Mr. Gilchrist.

A comprehensive survey of the major problems and issues in administration and supervision of the secondary school.

Education 829a given in the Summer of 1943.

*830. High School Administration and Supervision II. Five credit hours. Spring Quarter. General prerequisites must include Education 701 and 702. Mr. Eikenberry.

An advanced course in the specialized techniques of high school administration.

* Not given in 1943-1944.

831. The Secondary School Curriculum. Five credit hours. Spring Quarter. General prerequisites must include Education 701. Mr. Alberty.

A critical study of the construction, reorganization and administration of secondary school curricula and programs of study.

Given in the Summer of 1943.

*833. Evaluation of Secondary Schools. Three credit hours. Autumn Quarter. General prerequisites must include Education 701 and 702 or their equivalent. Lectures, reports, field studies.

A critical study of techniques of evaluating secondary schools with particular reference to the techniques developed by the Cooperative Study of Secondary School Standards and the Commission on the Relation of School and College of the Progressive Education Association.

834. Supervised Field Service in Education. Three to five credit hours. Autumn, Winter, and Spring Quarters. Open only to students who hold the degree of Bachelor of Science in Education from The Ohio State University or its equivalent. Open only by arrangement with the Director of Student Teaching. Mr. Landsittel and supervisors.

Supervised teaching or other approved educational service under compensated appointment in a system of schools for a minimum, in conjunction with Education 835, of half of a school year, half-time throughout the year or full-time for half of the year. Critical pre-study of objectives, instruments, and procedures and after-evaluation; a general appraisal of the total experience or certain aspects thereof to form in all cases an integral part of the master's thesis.

Open only to candidates for the Master's degree in a teaching field in The Ohio State University. Credit to be withheld until eligibility for the degree otherwise has been attained.

835. Supervised Field Service in Education. Three to five credit hours. Autumn, Winter, and Spring Quarters.

A continuation of Education 834.

*838. The Teaching and Supervision of English in the Secondary Schools. Three credit hours. Conferences, readings, reports. General prerequisites must include Education 670 (670a and 670b) and 671 (672) or permission of the instructor. Mr. Seely.

The course consists of two phases: (1) the analysis of contemporary contributions to the reorganization of materials and methods of secondary school English; (2) the study by each student of an individually selected problem.

HIGHER EDUCATION AND TEACHER TRAINING

845-†846. Higher Education I; Higher Education II; Basic Courses. Five credit hours. Autumn Quarter. The work of each Quarter is so arranged that either course may precede the other. General prerequisites must include ten Quarter-hours in secondary education and the satisfaction of basic course requirements for all graduate students in education. Open only to graduate students majoring in higher education, including teacher training. Mr. Klein, Mr. Anderson.

A basic survey of problems in higher education, particularly as these relate to theory, history, organization and administration, curriculum and method, and student personnel, including measurement.

Education 846 given in the Summer of 1943.

*847. Theory and Administration of Higher Education. Five credit hours. Winter Quarter. General prerequisites must include five hours in education approved by the instructor and the satisfaction of basic course requirements for all graduate students in education. Mr. Klein.

This course will study the theoretical and practical problems involved in the administration of institutions of higher education under modern social conditions.

848. Curriculum and Method of Higher Education. Five credit hours. Spring Quarter. General prerequisites must include five hours in higher educa-

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

tion and the satisfaction of basic course requirements for all graduate students in education. Mr. Hullfish.

A study of the development, principles, and administration of the curriculum and of teaching methods in higher education.

Given in the Summer of 1943.

850. Teacher Training. Five credit hours. Autumn Quarter. General prerequisites must include five hours in higher education and satisfaction of basic course requirements for all graduate students in education. Mr. Anderson.

A study of the problems of history, organization, administration, curriculum and method, student personnel (including measurement) peculiar to teacher training institutions.

Given in the Summer of 1943.

852. Achievement Tests in Higher Education. Three credit hours. Winter Quarter. One two-hour period and two hours of laboratory each week to be arranged. Mr. Raths.

A course for college instructors and research workers, to acquaint them with the techniques used in measuring attainment in the several fields of college instruction. Each student will carry on an examination project in his field.

Given in the Summer of 1943.

INDUSTRIAL EDUCATION

856. Practicum in Industrial Arts Education. Three to five credit hours. Winter Quarter. Mr. Warner.

Investigations, reports and discussions concerning: nomenclature, historical development; analysis of professional objectives for their concepts: emphasis by grade levels; criterion basis of content selection and appraisal; teaching methods and devices; physical planning; organization; laboratory operation; evaluation; the teacher and his profession.

Given in the Summer of 1943.

*857. Administration of Industrial Education in Secondary Schools. Thre credit hours. Spring Quarter. Mr. Stone.

Relation of Industrial Arts and Vocational Education to the general curriculum and the administrative responsibilities entailed. Courses of study; relative costs; coordination problems; class and shop organization, and the development of an effective program of supervision. Selection of teachers and their improvement in service. Of interest to school administrators and teachers of industrial arts and vocational-industrial subjects.

860. Scientific Studies in Practical Arts and Industrial Vocational Education. Two credit hours. Autumn Quarter. Mr. Warner, Mr. Smith.

An extensive view of research techniques applicable to the practical arts and vocational education; critical review and evaluation of published research examples in these fields; recognition and refinement of problems; study of research treatment; methods of writing and presenting research reports.

By permission of the Chairman of the Department of Education and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

Given in the Summer of 1943.

†866. Research in the Laboratory of Industries. Three or more credit hours. Conferences and studies using the activities in the Laboratory of Industries as a basis for research. In addition to the general prerequisites, teaching experience in Industrial Arts or Vocational Industrial Education and permission of the instructor are required. Mr. Warner.

Individual or group studies on a combination practicum and laboratory basis with the publication of either a professional or technical bulletin as a goal. Selection to meet the requirements of the group are suggested by: pupil study, diagnosis and achievement; problems of organizing and supervising a Laboratory of Industries; units of content; studies of industry; analysis of method; experimentation and development of programs.

Given in the Summer of 1943.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

SUPERINTENDENCY

*836. School Surveys. Three credit hours.

A study of the literature and methods of school surveys, as a basis for the investigation of practical problems in school administration and supervision.

†871. Administrative Problems of the City Superintendent. Two credit hours. Five lectures each week and assigned readings and reports. Mr. Lewis.

An advanced course for city superintendents. A study of the social and legal status of the city superintendent; his civic and economic relationship to agencies of the community; an intensive study of specific problems of immediate and outstanding importance in their relationship to the administration of a city school system such as: N.R.A., finance, county reorganization, educational bearings of recent social and economic development, locally and nationally.

Given in the Summer of 1943.

873. Staff Personnel Administration. Four credit hours. Autumn Quarter. General prerequisites must include Education 727. Mr. Lewis.

Definitions; rise of industry, government and education; philosophy of; man analysis and job analysis; selection; interviewing; in-service training; appraisement; supervision; absenteeism; marital condition; promotion; contracts, certification, dismissal, health and recreation; ethics, morale; public and professional relations; pensions; tenure; salary schedules and other factors of economic and professional welfare.

Given in the Summer of 1943.

875. School Finance. Three credit hours. Autumn Quarter. Three lectures each week. Assigned readings, investigations and reports. Education 727 must be included in the general prerequisites or taken concurrently. Mr. Reeder.

The literature and sources of data; trends of school costs; outlook for future costs; possible school economies; school expenditures vs. ability to expend; sources of school revenues; meeting a financial stringency; the equalization of educational opportunity; the control of school funds; school indebtedness.

Given in the Summer of 1943.

878. Federal and State School Administration. Three credit hours. Winter Quarter. Three lectures each week. Assigned readings, investigations and reports. General prerequisites must include Education 727.

Present conditions and the program of the federal department of education and of the departments of education of the several progressive states. The adjustment between national and state programs and the relationship of both of these to local administrative agencies. The state administration of the schools of Ohio.

*880. Planning, Constructing, and Equipping School Buildings. Five credit hours. Autumn Quarter. Assigned readings, observation trips, reports. General prerequisites must include Education 727. Mr. Holy.

A study of the major problems involved in determining the school building needs of a community, techniques for determining room requirements, types of buildings, their construction and adaptation to educational needs, school sites and present day equipment for school buildings, including types and arrangement of equipment for special and regular rooms, auditoriums, gymnasiums, libraries, cafeterias, offices, service systems, methods of selecting and purchasing equipment.

NOTE: For additional courses in the Superintendency area see Education 767, The Education of Exceptional Children; Psychology 682, Educational Tests and Measurements; Physical Education 683, Organization and Administration of Physical Education.

†898. Planning Community Adult Education Programs. Three credit hours. General prerequisites must include Education 770 and permission of the instructor must be obtained. Mr. Nisonger.

A study of community agencies with adult education programs; how new programs may be developed in terms of needs which are not being met.

Given in the Summer of 1943.

NOTE: For additional courses in special and adult education, see the Bureau of Special and Adult Education, page 69.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

ELECTRICAL ENGINEERING
Office, 171 Robinson Laboratory

PROFESSORS DREESE, CALDWELL (EMERITUS), KIMBERLY, AND AYRES, ASSOCIATE PROFESSORS TANG AND EVANS, ASSISTANT PROFESSORS BOONE, HIGGY, AND JORDAN. MR. WEIMER, MR. BELL, MR. WANG

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

The following courses do not carry graduate credit for a student who received the degree of Bachelor of Electrical Engineering from The Ohio State University: 603, 604, 607, 611, 642, 643, 661, 701, 702, 703, 705, 706, and 741.

603. Alternating Current Circuits. Five credit hours. One Quarter. Autumn, and Winter. Five class hours each week. Mr. Tang, Mr. Evans.

Resistance, inductance, capacitance, reactance, impedance, mutual inductance series and parallel circuits, complex circuits, coupled circuits, power, power factor, polyphase systems. Complex notation, network theorems, and transients in simple circuits.

604. Alternating Current Laboratory. Two credit hours. One Quarter. Autumn and Winter. Three laboratory hours each week. Electrical Engineering 603 must be taken concurrently. Mr. Tang, Mr. Evans.

Laboratory study of wave forms, series and parallel circuits, phase differences, polyphase circuits, coupled circuits, and network theorems.

607. Engineering Electronics. Four credit hours. Winter Quarter. Three class hours and three laboratory hours each week. General prerequisites must include Electrical Engineering 603 or equivalent. Mr. Boone.

The fundamental phenomena of electron behavior in electric and magnetic fields, electron emission, electric conduction in gases, characteristics and applications of high vacuum and gas-filled electronic equipment.

611. Medium and High Frequency Circuits. Five credit hours. One Quarter. Winter and Spring. Three class hours and one three-hour laboratory period each week. General prerequisites must include Electrical Engineering 603. Mr. Tang, Mr. Jordan.

General analysis of alternating current circuits under wide ranges of frequency and impedance conditions. Fourier analysis, network theorems, resonance phenomena, modulation, bridge circuits, and coupled circuits. Alternating current measurements at medium and high frequencies.

642. Electrical Engineering. Four credit hours. One Quarter. Autumn, Winter, Spring. Three class hours and three laboratory hours each week. Mr. Kimberly, Mr. Weimer, Mr. Wang.

The electric current and its effects. Direct and alternating current circuits. Electrical measurements. Magnets and their application. Electric heating. D-c generators, d-c motors and their control.

643. Electrical Engineering. Four credit hours. One Quarter. Autumn, Winter, Spring. Three class hours and three laboratory hours each week. General prerequisites must include Electrical Engineering 642 or equivalent. Mr. Kimberly, Mr. Weimer, Mr. Wang.

A continuation of electrical engineering fundamentals. Transmission and distribution. A-c motors and their application and control, a-c generators, meters, power and energy rates, power factor correction, transformers, economics of engineering applications, illumination, rectification, and thermionic devices.

***661. Electrical Engineering Survey.** One-half credit hour. Autumn Quarter. One class hour each week.

A course of lectures designed to give electrical engineering students some insight into other fields of thought.

701. Alternating Current Apparatus. Four credit hours. One Quarter. Autumn and Winter. Four class hours each week. General prerequisites must

* Not given in 1943-1944.

include a course in direct current apparatus and Electrical Engineering 603 and 604. Electrical Engineering 705 must be taken concurrently. Mr. Dreese.

Theory of transformers, synchronous generators, synchronous motors, induction motors, and apparatus.

702. Alternating Current Apparatus. Four credit hours. One Quarter. Winter and Spring. Four class hours each week. General prerequisites must include Electrical Engineering 701 and 705. Electrical Engineering 706 must be taken concurrently. Mr. Dreese.

Continuation of Electrical Engineering 701.

703. Advanced Alternating Current Circuits. Four credit hours. Autumn Quarter. Three class hours and three laboratory hours each week. General prerequisites must include Electrical Engineering 66. Mr. Jordan, Mr. Ayres.

The propagation of alternating currents over long lines, loading, electrical filters, inductive interference.

705. Alternating Current Machinery Laboratory. Three credit hours. One Quarter. Autumn and Winter. Five laboratory hours each week. Concurrent, Electrical Engineering 701. Mr. Dreese.

Laboratory study accompanying Electrical Engineering 701.

706. Alternating Current Machinery Laboratory. Three credit hours. One Quarter. Winter and Spring. Five laboratory hours each week. Concurrent, Electrical Engineering 702. Mr. Dreese.

Continuation of Electrical Engineering 705.

711. Generation, Transmission, Distribution, and Utilization of Electric Power. Four credit hours. Winter Quarter. Three class hours, and three laboratory hours each week. General prerequisites must include Electrical Engineering 703. Mr. Ayres.

A comprehensive view of the methods of generating electric power by thermal and water power plants, especial attention being devoted to the electrical aspects of such plants, a detailed consideration of electric power transmission and distribution, and a study of the utilization of electric power in industry. Laboratory covers high-voltage phenomena and advanced a-c machinery.

712. Generation, Transmission, Distribution, and Utilization of Electric Power. Four credit hours. Spring Quarter. Three class hours and three laboratory hours each week. General prerequisites must include Electrical Engineering 607 and 711. Mr. Ayres.

A continuation of Electrical Engineering 711. Inspection trips may replace some laboratory hours.

717. Communication Engineering. Four credit hours. Winter Quarter. Three class hours and three laboratory hours each week. General prerequisites must include Electrical Engineering 703 and 607. Mr. Jordan.

Equalizers, coupled circuits at radio frequency, impedance matching networks, and the use of vacuum tubes as oscillators, amplifiers and detectors at medium and high frequencies.

720. Electrical Illumination. Four credit hours. Winter Quarter. Three class hours and three laboratory hours each week. Mr. Tang.

Illumination, its development and present methods. Modern light-sources, and modification of light by reflectors, globes and other accessories. Light phenomena associated with illumination, such as reflection, transmission and absorption, direction and diffusion, refraction and color. Infra-red and ultra-violet radiation. Applications of illumination to industrial work, buildings, street-lighting, aviation, light-projection, etc.

721. Electrical Illumination. Four credit hours. Spring Quarter. Three class hours, three laboratory hours, and six hours of preparation each week. General prerequisites must include Electrical Engineering 720. Mr. Tang.

A continuation of Electrical Engineering 720. Inspection trips may replace some laboratory hours.

722. Electrical Illumination. Three credit hours. Autumn Quarter. Three class hours each week. Mr. Tang.

Modern lighting, both electric and daylight, especially as applied to buildings, such as industrial plants, stores, schools, residences, etc. A brief study of lamps and accessories and the phenomena of reflection, transmission, glare, diffusion, color, etc., as they affect illumination design. Circuits for electric lighting and their control.

726. Advanced Electrical Communication. Four credit hours. Spring Quarter. Three class hours and three laboratory hours each week. General prerequisites must include Electrical Engineering 717. Mr. Jordan.

An advanced study of medium and high frequency alternating current circuits. Radiation fields and their measurement.

732. Engineering Projects. Four credit hours. Winter Quarter. Six hours in calculation periods each week. General prerequisites must include Electrical Engineering 741, 611, and Mechanics 607. Mr. Dreese.

A study of electrical projects involving a correlation of the fundamental principles of mechanics, heat, finance and electrical engineering for some desired end. Another important objective of the course is to inculcate the spirit of the attack on an engineering problem and to demonstrate the interplay of factors involved in a decision by an engineering organization.

741. Economics and Organization of the Electrical Industry. Three credit hours. Autumn Quarter. Three class hours each week. General prerequisites must include a course in direct current apparatus and Electrical Engineering 603 or 642 and 643. Mr. Ayres.

Financial calculations of electrical enterprises, examples being taken from power and communication utilities, and manufacturing. Economic aspects of the principal divisions of the electrical industry, and a study of the organizations existing in power supply, communication, electrical manufacturing and merchandising.

757. Ultra High Frequency Engineering. Four credit hours. Winter Quarter. Three class hours and three laboratory hours each week. General prerequisites must include fundamental courses in alternating current theory and electronics and the permission of the instructor. Mr. Jordan, Mr. Bell, Mr. Wang.

The generation and detection of ultra-high frequency oscillations at wave lengths of a few centimeters, their transmission by two conductor lines and wave guides, their control in time and space and the recording of their behavior. A study of the use of velocity modulation tubes, magnetrons, electromagnetic field theory, wave guides, transient phenomena, electromagnetic horns, antennas, wide band amplifiers and multiple detection receivers as used in applications of ultra-high frequency phenomena.

758. Ultra High Frequency Engineering. Four credit hours. Spring Quarter. Three class hours and three laboratory hours each week. General prerequisites must include Electrical Engineering 757. Mr. Jordan, Mr. Bell, Mr. Wang.

A continuation of Electrical Engineering 757.

760-761-762. Advanced Theoretical Study of Electrical Engineering Practice and Equipment. Credit hours to be arranged. Autumn, Winter, and Spring Quarters. All instructors.

765-766-767. Special Advanced Laboratory. Credit hours to be arranged. Autumn, Winter, and Spring Quarters. All instructors.

770. Analysis of Electrical Engineering Problems. Three credit hours. Spring Quarter. Three class hours each week. General prerequisites must include Electrical Engineering 603. Mr. Dreese.

The content will be selected from the following fields: theory of equations, differential equations, Heavyside operators. The applications will be illustrated by examples from electrical engineering and related fields.

780. Engineering Industrial Problems. Three credit hours. Spring Quarter. Three class periods each week. General prerequisite must include Electrical Engineering 701 or 702, or 642 or 643. Mr. Kimberly.

Layout of electrical distribution systems for factories and municipalities, electrolysis investigation, special cases of electric drive and control, engineering aspects of patents.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include foundation courses in mathematics, physics and electrical measurements.

The general prerequisites include for 821 and 824, Electrical Engineering 701 and 702, or equivalent; for 825, Electrical Engineering 824; for 826, Electrical Engineering 824; for 882, Electrical Engineering 717, or equivalent.

Graduate work will be given to individual students and groups under the course numbers given below. The following are the fields of special interest of the instructors listed. Other lines of study, are, however, taken up under their supervision. Mr. Dreese, Electrical Machinery. Mr. Ayres, Transmission and Distribution, Alternating Current Apparatus, Electric Traction. Mr. Jordan, Electrical Communication. Mr. Kimberly, Electrical Instruments, Alternating Current Apparatus. Mr. Tang, Illumination, Alternating Current Apparatus, Electrical Mathematics. Mr. Boone, Electronics.

801-802-803. Advanced Theoretical Study of Electrical Engineering Practice and Equipment. Credit hours to be arranged. Autumn, Winter, and Spring Quarters.

805-806-807. Advanced Laboratory Study of Electrical Engineering Equipment. Credit hours to be arranged. Autumn, Winter, and Spring Quarters.

811. Matrices in Electrical Engineering. Three credit hours. Spring Quarter. Mr. Tang.

A study of the fundamentals of matrix algebra, followed by the application of matrices to the solution of general static networks. Symmetrical components. Problems of three-phase circuits, and n-terminal networks, will be considered. This course serves as a good introduction to the application of tensor algebra to electrical engineering problems.

815. Heaviside's Operational Calculus. Three credit hours. Autumn Quarter.

A review of classical methods for the solution of transients in electric circuits, followed by a study of the special technique introduced by Oliver Heaviside and developed by Carson, Bush, Berg, and others. The principles of superposition, formation of the impedance function, distributed parameters, unit function, driving point and transfer indicial admittance, infinite integral theorem, the Heaviside expansion theorem and its use.

816. Heaviside's Operational Calculus. Three credit hours. Winter Quarter.

A continuation of Electrical Engineering 815 covering the following: methods for the evaluation of operational expressions, shifting and transfer formulas, use of the functions of a complex variable, operational equivalents of the Fourier series and integral treatments of networks, fractional order derivatives, and the series expansion of operators.

821. Revolving Fields and Permeances in Electrical Machinery. Three credit hours. Autumn Quarter. Three class hours each week. Mr. Dreese.

An analysis of the various revolving and stationary fields found in electrical machinery. The origin and effects of both useful and parasitic fluxes are considered. Discontinuities and cusps in speed-torque curves of induction machines, synchronous-motor effects in induction machines, sub-synchronous speeds in induction and synchronous machines, and design for sub-synchronous operation are topics studied in this course.

822. Revolving Fields and Permeances in Electrical Machinery. Three credit hours. Winter Quarter. Three class hours each week. Mr. Dreese.

Continuation of Electrical Engineering 821.

824-825-826. Advanced Synchronous Machine Theory. Three credit hours. Autumn, Winter, and Spring Quarters. Three class hours each week. Mr. Evans.

Review of fundamental considerations, general development of theory of symmetrical components, application to unbalanced loads on generators and systems, transient characteristics of synchronous machines, and system stability.

831. Transmission Networks. Three credit hours. Winter Quarter. Three class hours each week. General prerequisites must include Electrical Engineering 703 or equivalent. Mr. Ayres.

General treatment of four terminal networks, such as long lines, filters and equalizers, including design of composite filters; use of matrices in analysis; operation of filters in parallel. The use of the Fourier integral in analysis of transients.

832. Electromagnetic Radiation and Radiating Systems. Three credit hours. Spring Quarter. Three class hours each week. Mr. Jordan.

Scalar and vector fields. Maxwell's equations, electromagnetic radiation and propagation, antenna systems, including a study of current literature.

833. Electro-Acoustical Systems. Three credit hours. Autumn Quarter. Three class hours each week. Mr. Jordan.

Study of the production, transmission, and utilization of acoustic energy by electrical means. Microphones, loud speakers, horns, the laws of mechanical vibrating systems and their coupling to electrical networks, the laws of sound propagation, and the acoustic treatment of sound enclosures.

841. Advanced Electronics. Three credit hours. Winter Quarter. Mr. Boone.

Analysis of potential distribution in triodes and in equivalent triodes; effects of space charge. Kinetic theory of ideal gases as applied to electric conduction. Velocity and energy distributions for a degenerate electron gas; thermionic emission from pure metals and from composite surfaces. Photoelectric emission. Electric arc and glow discharges; initiation and extinction of the plasma. Application to gaseous rectifiers.

842. Electron Optics. Three credit hours. Spring Quarter. Three class hours each week. General prerequisites must include Electrical Engineering 607 or equivalent. Mr. Boone.

Methods of determination of the electron trajectory; electron lenses and lens systems; lens aberrations; dense electron beams; theory of the electron gun; electron multipliers; image tubes; the electronics of television equipment; the electron microscope.

950. Research in Electrical Engineering. Autumn, Winter, and Spring Quarters. All instructors.

NOTE: Detailed schedules of graduate studies available under the above course number may be obtained on application to the Department of Electrical Engineering.

ENGINEERING DRAWING
Office, 218 Brown Hall

PROFESSORS MEIKLEJOHN AND PAFFENBARGER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

701. Chemical Machine Drawing. Two credit hours. Spring Quarter. Six laboratory hours each week. Mr. Paffenbarger.

The drawing and introduction to the design of machinery and apparatus as related to industrial chemistry and chemical engineering.

Given in the Summer of 1943.

704. Chemical Plant Layout and Design. Four credit hours. Autumn Quarter. Twelve laboratory hours each week. General prerequisites must include Engineering Drawing 701. Mr. Paffenbarger.

Sketching and preliminary layout of industrial chemical plants. Design and drawing of a complete plant for the manufacture of a chemical or related product.

NOTE: TEACHING COURSES. For the Teaching Courses in this department see the Department of Education, Courses 696, 697, and 698.

ENGINEERING EXPERIMENT STATION

The Engineering Experiment Station is a division of the College of Engineering and was established by law to conduct technical research. The Station is authorized to cooperate with divisions of the State and National governments and with private individuals and corporations.

In many cases the Station investigations are such as may properly be conducted by graduate fellows working under direction of members of the faculty or Station staff. It follows, therefore, that not infrequently candidates for a graduate degree work out their theses or dissertations utilizing the equipment of the Station.

ENGLISH

Office, 120 Derby Hall

PROFESSOR FULLINGTON, McKNIGHT (EMERITUS), GRAVES (EMERITUS), BECK, PERCIVAL, HATCHER, WALLEY, WILSON, AND DERBY, ASSOCIATE PROFESSORS SNOW AND PARKER, ASSISTANT PROFESSORS ESTRICH, BEACH, LOGAN, HUGHEY AND UTLEY

General Information for Graduate Students:

(1) Graduate study in English requires an undergraduate major in English (i.e., not less than the equivalent of forty Quarter hours in advanced courses in English and related subjects, at least twenty-five of which must be in English). Students deficient in this respect must make up the deficiency by taking such extra or compensatory work as the department advisers may deem necessary.

(2) Graduate students taking work leading toward the M.A. degree generally fall in one of two classifications: (a) those desiring to take further academic work possibly leading to the Ph.D. degree, and (b) those planning a professional career in secondary schools. It is expected that the course of study for the M.A. (academic) will differ from that for the M.A. (professional).

(3) The requirements for the M.A. (academic) are forty-five hours of English and related subjects. Concentration in a field of study is desirable and will be arranged with respect to the student's needs. The master's thesis should be of such nature as to demonstrate the candidate's ability to carry on research. The final examination will be limited to the candidate's major field of concentration, in which he will be expected to demonstrate a high degree of competence.

(4) The requirements for the M.A. (professional) are forty-five hours of English and related subjects so comprehensively planned that the candidate will have an adequate knowledge of (a) the history and development of the English language, (b) teaching methods in English, and (c) the chief figures and epochs of English and American Literature from Chaucer to the modern day. Ordinarily at least twenty-five hours of English will be required for this program, but special arrangements may be possible for the mature student whose undergraduate preparation has been unusually thorough, and who may need special work in other departments for the advancement of his professional career. The master's thesis on this program will be a critical or historical study of some aspect of a major figure or epoch in English or American literature. In the final examination the candidate will be expected to demonstrate a comprehensive knowledge of the main developments in the history of English and American language and literature, and to prove his competence as an interpreter and critic of literature.

(5) All graduate students working for the M.A. degree will be expected to consult regularly with the duly appointed department advisers for that degree, and no program for such work will be accepted by the Department until it has been formally approved. Ordinarily candidates for the M.A. degree will be expected to take their work in "600" and "700" courses.

(6) The requirements for the Ph.D. degree in English are (a) at least one full year (forty-five hours) of study after the completion of the M.A. (or its equivalent), (b) a thorough reading knowledge of one modern foreign language, and a working knowledge of one other language, ancient or modern (to be determined by the candidate's needs for his field of specialization), (c) the satisfactory passing of a written and oral examination for admission to candidacy, and (d) the submission of a satisfactory thesis. Candidates for the Ph.D. will be expected to take their work in the "700" and "800" courses. Courses on the "600" level may be taken for credit only by permission of the Chairman of the Graduate Committee.

Graduate students interested in instruction or study not provided by the formal offerings should consult with the Chairman of the Graduate Committee or with their advisers on possible arrangements.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

*608. American Literature. Five credit hours. Given in alternate years. Mr. Beach.

Selected American writers will be read for their interpretation of American thought and culture. Special attention will be given to their significance in the light of twentieth century interests and developments. Not an historical survey but a consideration of the important epochs in the emergence of American literature.

Not open to students who have credit for English 609.

625. Standards of English Usage. Five credit hours. Winter Quarter. Mr. Estrich.

This course provides training in standards of grammar, spelling, pronunciation, and vocabulary for students interested in writing, teaching, the art of expression, or the development of their own culture. The approach is functional throughout, rather than historical or descriptive.

Not open to students who have credit for English 528.

627. The Language We Speak. Five credit hours. Autumn Quarter. Given in alternate years. Mr. Utley.

A study of the history of English, of its words and structure and logic, of its cultural patterns and philosophical significance, of its use as an instrument of communication and human living.

Given in the Summer of 1943.

635. The Age of Wit and Satire. Five credit hours. Autumn Quarter. Given in alternate years. Mr. Wilson.

The skeptical and critical mind of the Early Enlightenment as reflected in lyric and satiric verse from Dryden through Pope; the comic wit of the Restoration, and the bitter wit of Swift.

†637. Johnson and His Circle. Five credit hours. Spring Quarter. Given in alternate years. Mr. Percival.

The character and opinions of Dr. Johnson, as found in Boswell's *Life of Johnson* and *Tour of the Hebrides*, with attention to the members of his circle, and as a background, the ideals of the Enlightenment.

Given in the Summer of 1943.

641. The Romantic Temper. Five credit hours. One Quarter. Autumn and Winter. Mr. Beck, Mr. Snow, Mr. Logan.

The influence of the French Revolution and the preeminence of the Romantic ideal. Wordsworth, Coleridge, Byron, Shelley, Keats, Hazlitt, Lamb, De Quincey, Scott, and Jane Austen.

Given in the Summer of 1943.

642. The Victorian Compromise. Five credit hours. One Quarter. Winter and Spring. Mr. Derby, Mr. Beck.

The spirit and temper of the Victorian period as seen in the poetry of Tennyson and Browning, the essays of Carlyle and Ruskin, three representative Victorian novels, the poetry and prose of Arnold, the Pre-Raphaelites, and the later minor Victorians.

Given in the Summer of 1943.

643. The Writing Laboratory. Five credit hours. Spring Quarter. Three group meetings and individual consultations each week. Permission of the Department. Students should submit examples of their own work when applying for admission. Mr. Hatcher.

This course will deal with the materials and methods of creative writing in the shorter forms of fiction, essay, and criticism. Guidance will be given in the various problems of writing through individual conferences and group discussions.

653. Chaucer. Five credit hours. Spring Quarter. Given in alternate years. Mr. Estrich.

A close study of Chaucer's principal works and of the poet's development as artist in relation to his social and literary background.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

*655. The Novel. Five credit hours. Winter Quarter. Four meetings each week with special reading in lieu of the fifth meeting. Given in alternate years. Mr. Hatcher.

A study of the novel, not as an historical survey, but as a preferred international art form from Trollope and Flaubert to the present day. An acquaintance is assumed with the standard authors, such as Fielding, Scott, Austen, Dickens, and Thackeray.

†669. The Older Drama. Five credit hours. Autumn Quarter. Five meetings each week. Given in alternate years. Mr. Wilson.

The history of English Drama, from the Elizabethans to the early Nineteenth Century—a survey of important types and forms considered in connection with their social and theatrical backgrounds. The best plays of Marlowe, Jonson, Beaumont and Fletcher, Dryden, Congreve, Cibber, Rowe, Goldsmith, Sheridan, and others.

Not open to students who have credit for English 677.

Given in the Summer of 1943.

670. Recent and Contemporary Drama. Five credit hours. Winter Quarter. Four meetings each week with special reading in lieu of the fifth meeting. Given in alternate years. Mr. Hatcher.

The social, intellectual, and scientific forces characteristic of recent times reflected in the artistic medium of the plays of Ibsen, Strindberg, Hauptmann, Wedekind, Kaiser, Toller, Chekov, Gorky, Andreyev, Brieux, Rostand, Maeterlinck, Vildrac, Capek, Molnar, Schnitzler, Pirandello, Benavente, Wilde, Shaw, Galsworthy, O'Casey, Milne, Howard, Rice, Barry, O'Neill, and others.

671. Milton and the Literature of Crisis. Five credit hours. Winter Quarter. Given in alternate years. Mr. Parker.

Study of Milton's period as an age of spiritual and political conflict as reflected in its non-dramatic literature, particularly the writing of Milton. Consideration of Spenser and Puritanism, metaphysical poetry and religious reaction, growth of the classical temper and scientific spirit, development of modern prose.

*674. The Temper of the Renaissance. Five credit hours. Autumn Quarter. Given in alternate years. Mr. Walley.

A consideration of English thought and expression during the Sixteenth and Seventeenth Centuries in the light of their enduring contribution to the adventure of human living.

676. Shakespeare. Five credit hours. Spring Quarter. Given in alternate years. Mr. Walley.

A critical consideration of the art, personality, and achievement of Shakespeare in the light of Renaissance culture. Shakespeare's work is viewed as an integrated totality and evaluated in terms of its significance for modern times.

701. Minor Problems in English. One or more credit hours. Summer, Autumn, Winter, and Spring Quarters.

Students may register for directed study under this number by arrangement with the appropriate member of the staff. Students who wish to continue study entered upon in other "700" courses in the department should consult the appropriate instructor as indicated below:

(a) American Literature, Mr. Beach.
(b) Victorian Literature, Mr. Derby.
(c) Medieval Literature, Mr. Estrich, Mr. Utley.
(d) Sixteenth Century Literature, Miss Hughey.
(e) Romantic Literature, Mr. Logan.
(f) English Language, Mr. Utley, Mr. Estrich.
(g) Contemporary Literature, Mr. Hatcher.

Given in the Summer of 1943.

709. Special Studies in American Literature. Five credit hours. Winter Quarter. Five sessions each week. Given in alternate years. English 608 is recommended as a prerequisite. Mr. Beach.

The topics for study in 1943-1944 will be Puritanism and the Romantic Development in America.

Not open to students who have credit for English 865.

Given in the Summer of 1943.

* Not given in 1943-1944.
† Not given during the academic year, 1943-1944.

***716. Studies in Literary Theory.** Five credit hours. Spring Quarter. Given in alternate years. Mr. Percival.

A study of certain critical points of view, past and present, with practice in critical writing.

Not open to students who have credit for English 816.

727. Contemporary Literature. Five credit hours. Spring Quarter. Five sessions each week. Given in alternate years. Mr. Hatcher.

Reading and research in problems in the literature of the Twentieth Century.

Not open to students who have credit for English 827.

***744. Arnold.** Five credit hours. Spring Quarter. Five sessions each week. Given in alternate years. General prerequisites must include English 642. Mr. Derby.

Wide reading in the poetry and prose of Matthew Arnold, with a study of his background and his relation to both his own time and the Twentieth Century.

Not open to students who have credit for English 844.

745. Wordsworth. Five credit hours. Autumn Quarter. Five sessions each week. Given in alternate years. General prerequisites must include English 641. Mr. Logan.

Wordsworth as the pivotal figure in the Romantic Movement, the social and political thought of his day, the story of his life, his relation to his contemporary writers, his philosophy of Man and Nature, and his place in literature as a poet and thinker.

Not open to students who have credit for English 845.

***746. Middle and Modern English.** Five credit hours. Winter Quarter. Given in alternate years. General prerequisites must include English 751. Mr. Utley.

A study of Middle English through close analysis of texts, and of some of the technics of linguistic research through a Middle English dialect report; the history of Modern English will then be studied from the basis provided by this analysis of the transitional period.

Not open to students who have credit for English 646.

Given in the Summer of 1943.

750. Master's Thesis. Summer, Autumn, Winter, and Spring Quarters. Staff.

Given in the Summer of 1943.

***751. Language and Literature of the Anglo-Saxons.** Five credit hours. Autumn Quarter. Given in alternate years. Mr. Estrich.

This course aims by a study of Old English literature to reveal the language patterns, social culture, and literary accomplishment of the earliest speakers of English.

Not open to students who have credit for English 651 or 830.

***752. Medieval Literature.** Five credit hours. Autumn Quarter. Given in alternate years. General prerequisites must include English 751 or 746; English 653 is recommended. Mr. Utley.

On the basis of close textual study of such major Fourteenth Century writings as *Pearl*, *Sir Gawain*, and *Piers Plowman*, this course treats the social backgrounds and literary traditions of the age of Chaucer and Wyclif.

Not open to students who have credit for English 652.

***777. Elizabethan Drama.** Five credit hours. Spring Quarter. Given in alternate years. Mr. Walley.

An intensive study of the origins, developments, and significance of the first great cycle of English theatrical history. Especially designed for graduate students and for advanced undergraduates with a specialized interest in the drama.

Not open to students who have credit for English 677.

NOTE: TEACHING COURSES. For the Teaching Courses in this department see the Department of Education, Courses 670 and 671.

* Not given in 1943-1944.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45. Enrollment in these courses requires the approval of the student's graduate adviser.

835-836. Classic and Romantic. Five credit hours each Quarter. Winter and Spring Quarters. Given in alternate years. Permission of the instructor necessary.

A study of the classical ideal, critical and creative, of the early Eighteenth Century, followed by a study of the romantic ideal of the late Eighteenth and early Nineteenth Centuries.

*837-*838. Research in the Restoration Period. Five credit hours each Quarter. Winter and Spring Quarters. Four class meetings each week with a fifth at the option of the instructor. Given in alternate years. Permission of the instructor necessary. Mr. Wilson.

Individual research in Restoration Literature, Dryden to Pope; oral and written reports.

*871-*872. Studies in the Age of Milton. Five credit hours each Quarter. Autumn and Winter Quarters. Given in alternate years. Permission of the instructor necessary.

Special problems in Seventeenth Century research. Special attention to Milton's poetry of prose in relation to the cultural milieu of the period.

Not open to students who have credit for English 815.

875-876. Studies in the Age of Shakespeare. Ten credit hours. One Quarter. Autumn and Winter. Three to five sessions each week. Given in alternate years. Permission of the instructor necessary.

A study of the problems and materials of scholarship relating to Shakespeare and his theatrical and cultural environment.

880. Bibliography and Method. Five credit hours. Autumn Quarter. Five sessions each week. Given in alternate years. Permission of instructor necessary. Mr. Parker.

A course for the advanced graduate student in the methods and tools of documentary research.

881. Textual Criticism and Editing. Five credit hours. Spring Quarter. Four class meetings each week. Elective. Given in alternate years. General prerequisites much include English 880. Miss Hughey.

Methods employed by representative scholarly editors of English literature; evaluation of selected editions; training in the skills requisite to the scholarly editor; paleography, usage of early printed books, collation, annotation; practice in textual editing.

950. Research in English. Autumn, Winter, and Spring Quarters.

This course is to be used only for dissertation registration of candidates for the degree of Doctor of Philosophy. The candidate should consult the adviser in charge of his major.

Given in the Summer of 1943.

PUBLIC SPEAKING

(See Speech)

ENTOMOLOGY

(See Zoology and Entomology)

EUROPEAN HISTORY

(See History)

FARM CROPS

(See Agronomy)

* Not given in 1943-1944.

FINE ARTS
Office, 104 Hayes Hall

PROFESSORS HOPKINS, FANNING, BAGGS, A. ROBINSON, AND FREY, ASSOCIATE PROFESSORS BRADLEY, SHERMAN, ROOS, GRIMES, AND LITTLEFIELD, ASSISTANT PROFESSORS RANNELLS AND GATRELL

Admission: For unconditional admission to graduate work in the Department of Fine Arts, prerequisites corresponding to Fine Arts 501-502-503, and technical courses in the related 600 groups or their equivalent should be offered.

Requirements for the degree of Master of Arts. For properly qualified students two curricula, technical and non-technical, are offered, each leading to the degree of Master of Arts. To receive this degree students must have at least a "B" average in forty-five credit hours of 600, 700, or 800 courses, as listed in the curricula below; must complete a satisfactory thesis as required for all candidates for the Master's degree; and must pass a comprehensive examination after the completion of course credit and the acceptance of the thesis. The thesis may be written in the historical or non-technical curriculum, or, in the technical curriculum, may consist of painting, sculpture, design, or ceramic work. In any case a written statement of the problems and solutions, with illustrations showing the results, is required.

CURRICULUM IN FINE ARTS (TECHNICAL)

Fine Arts	(661) 5	Fine Arts	(662) 5	Fine Arts	(663) 5
Fine Arts	(801) 5	Fine Arts	(802) 5	Fine Arts	(803) 5
*Non-technical	5	*Non-technical	5	*Non-technical	5

*NOTE: For non-technical credit, selection may be made from the following allied courses: Fine Arts 654, 670, 671, 672, 673, 674, 677, 680, 681, 682, 689, 804, 805, 806, or courses in history, literature, or philosophy approved by the adviser.

CURRICULUM IN FINE ARTS (NON-TECHNICAL)

Fine Arts	(670) 2	Fine Arts	(672, 674 or 681) 2	Fine Arts	(654) 5
Fine Arts	(671) 3	Fine Arts	(682 or 673) 3	Fine Arts	(677) 3
Fine Arts	(801) 5	Fine Arts	(802) 5	Fine Arts	(803) 5
Fine Arts	(804) 5	Fine Arts	(805) 5	Fine Arts	(806) 5

With the consent of the adviser, substitution of other graduate subjects outside the Department of Fine Arts may be made when the special interest of the student warrants it. For combination curricula the student should consult the Department of Fine Arts in regard to proper sequence of courses. For technical credit (801-802-803) selection may be made from the following fields: drawing, design, painting, sculpture, ceramics.

The subject of the thesis, technical or non-technical, should be filed with the department before the second Quarter of graduate study. The faculty member under whom the major work of the student is done has charge of the thesis and should be consulted early in the program of study so that all courses may contribute to the preparation of the thesis.

Students whose general education, maturity, and experiences justify it may be admitted to courses without becoming candidates for the degree and pursue subjects for which they are qualified.

Requirements for the Degree Doctor of Philosophy: For students who have qualified for candidacy for the degree Doctor of Philosophy by satisfying scholastic and residence requirements (see page 41), and a dissertation may be offered in either technical or non-technical studies, its form being determined by the nature of the subject. For a technical thesis, such as a collection of paintings or work of sculpture, an accompanying manuscript with photographic records of the work is required.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

600. The Theory and Practice of Teaching Art. Five credit hours. Winter Quarter. Five periods each week with outside laboratory assignments, observations and required readings. Miss A. Robinson.

A course dealing with the teaching and supervision of art in the elementary, middle and high schools.

Given in the Summer of 1943.

625. Advanced Life Drawing. Five credit hours. One Quarter. Autumn, Winter, Spring. General prerequisites must include a course in drawing from life. Mr. Sherman.

Advanced problems in drawing from life and figure composition.

645-646-647. Portrait Painting. Five credit hours. Autumn, Winter, and Spring Quarters. Five three-hour periods each week. Mr. Hopkins.

Painting from life. The organization and development of pictures with special reference to the delineation of character

Fine Arts 647 given in the Summer of 1943.

650. Methods and Materials of the Painter. Three credit hours. Autumn Quarter. General prerequisites must include Fine Arts 645-646-647. Mr. Grimes.

A study of painting materials, the composition of pigments, binders, and varnishes. A review of ancient methods of painting with a consideration of their possibilities for contemporary use. Egg tempera, varnish tempera, under-painting, and oil glazes. Laboratory practice and lectures.

654. History of Renaissance Art. Five credit hours. Spring Quarter. Five lectures each week. Mr. Fanning.

The study of the Renaissance movement in Italy as reflected in architecture, painting, and sculpture; its influence upon other countries and its relationship to the intellectual trend from the Fifteenth to the Nineteenth Century.

***656. History of Oriental Art.** Five credit hours. Winter Quarter. Five lectures each week. Mr. Fanning.

The study of Asiatic culture expressed by the historical development of architecture, sculpture, and painting in Persia, India, China, and Japan. Illustrated lectures, reading, and reports.

661-662-663. Technical Problems. Three to five credit hours. Enrollment in these numbers may be continued up to a total of fifteen hours each. Autumn, Winter, and Spring Quarters. Open by permission of the department to students in technical fields who have completed the other laboratory courses in their areas and who wish an opportunity for further research in specialized problems.

(a) Water color painting. Miss Bradley, Mr. Rannells.
(b) Oil painting. Mr. Grimes, Mr. Hopkins.
(c) Life drawing. Mr. Gatrell, Mr. Sherman.
(d) Sculpture. Mr. Frey.
(e) Ceramics. Mr. Baggs, Mr. Littlefield.
(f) Design. Mr. Sutton, Mr. Rannells, Miss Bradley.

Fine Arts 662 given in the Summer of 1943.

670. History of the Art of Ancient Egypt and Mesopotamia. Two credit hours. Autumn Quarter. Mr. Fanning.

The specialized study of the ancient arts of the valleys of the Nile and Tigris-Euphrates and their influence upon eastern Mediterranean culture. Lectures, discussions, and presentation by each student of some special problem of research.

671. History of Hellenic Art. Three credit hours. Autumn Quarter. Mr. Fanning.

The specialized study of Greek architecture, sculpture, and painting. Lectures, round table discussions and presentation by each student of some special problem of research.

***672. History of Islamic Art.** Two credit hours. Winter Quarter. Alternating with Fine Arts 674. Mr. Fanning.

The study of Moslem architecture and minor arts with special attention to origins and influences. Lectures, reading, and reports.

673. History of Christian Art of the Middle Ages. Three credit hours. Winter Quarter. Mr. Fanning.

The specialized study of various phases of Romanesque and Gothic art as an expression of medieval Christianity in Italy, France, Germany, Spain, and England. Lectures, reading, discussions, and reports on research topics.

674. History of Spanish Art. Two credit hours. Winter Quarter. Alternating with Fine Arts 672. Mr. Fanning.

The study of the architecture, sculpture, painting, and minor arts of Spain and the countries under Spanish influence. Lectures and reports.

* Not given in 1943-1944.

677. History of French Art from the Beginning of the Seventeenth Century to the Present Day. Three credit hours. Spring Quarter. Reading knowledge of French desirable. Alternating with Fine Arts 680.

A specialized study of the architecture, sculpture, and painting of modern France. Illustrated lectures, reading, and reports.

Given in the Summer of 1943.

***680. History of Art in Germany and the Low Countries.** Three credit hours. Spring Quarter. Reading knowledge of German desirable. Alternating with Fine Arts 677.

A specialized study of the architecture, sculpture, and paintings of the Germanic people and their relationship to social and political development. Lectures, reading, and reports.

Not open to students who have credit for Fine Arts 678 or 679.

681. History of English Art. Two credit hours. Winter Quarter. Mr. Roos.

A study of the work of outstanding architects, painters, and sculptors in England as an index of the artistic trend since the beginning of the Sixteenth Century. Illustrated lectures, reading, and reports.

Not open to students who have credit for Fine Arts 676.

682. History of American Art. Three credit hours. Winter Quarter. Mr. Roos.

A study of architecture, painting, and sculpture in America during the Eighteenth, Nineteenth, and Twentieth Centuries. Illustrated lectures, reading, and reports.

Not open to students who have credit for Fine Arts 676.

Given in the Summer of 1943.

689. Contemporary Art. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Roos.

The chronological development of artistic styles in Europe and America since the Industrial Revolution. Effects on present day art of significant movements.

701-702-703. Minor Problems. Three to five credit hours. Autumn, Winter, Spring Quarters. Mr. Hopkins, Miss Bradley, Mr. Grimes, Mr. Sherman, Mr. Baggs, Mr. Frey.

Open, by permission of the department, to graduate students who are qualified to do original work in painting, sculpture, or ceramics.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

801-802-803. Major Technical Problems. Three to five credit hours. Enrollments in these numbers may be continued up to a total of fifteen hours each. Autumn, Winter, and Spring Quarters. Mr. Hopkins, Mr. Fanning, Mr. Frey, Mr. Grimes, Mr. Baggs.

This course is open, by permission of the department, to graduate students who are qualified to do original work in ceramics, painting, or sculpture.

804-805-806. Major Historical Problems. Three to five credit hours. Enrollments in these numbers may be continued up to a total of fifteen hours each. Autumn, Winter, and Spring Quarters. Mr. Fanning, Mr. Baggs, Mr. Roos.

This course is open, by permission of the department, to graduate students who are qualified to do original research in the history of fine arts.

Fine Arts 805 given in the Summer of 1943.

950. Research in Fine Arts. Autumn, Winter, and Spring Quarters. Library, conference, and laboratory work. General prerequisites must include acceptable courses in the chosen field of research. The student may spend a part or all of his time on research work. Mr. Hopkins, Mr. Baggs, Mr. Fanning, Mr. Frey, Mr. Roos.

Given in the Summer of 1943.

FRENCH

(See Romance Languages and Literatures)

* Not given in 1943-1944.

GEOGRAPHY

Office, 416 Commerce Building

PROFESSORS SMITH, HUNTINGTON, VAN CLEEF, PEATTIE, AND CARLSON, ASSISTANT PROFESSOR WRIGHT, MR. McBRYDE, MR. McCUNE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

603. The Localization of Manufacturing Industries. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include elementary courses in geography or in economics. Mr. Wright.

The geography of manufacturing, particularly American industries. Industrial districts. Special study of representative industries as to: labor supply; sources, quantity, and value of material and power used; transportation facilities available; quantity and value of products; and problems of competition and markets.

Given in the Summer of 1943.

604. Conservation and Land Utilization. Three credit hours. Autumn Quarter. Three class meetings each week. General prerequisites must include elementary courses in geography or fifteen hours of allied subjects. Mr. Huntington.

The importance of our natural resources. The need for their conservation. Land as a natural resource and economic factor. Character and location as factors in land utilization and value. Regional and national planning for resource utilization.

605. Geography of Ohio. Two credit hours. Winter Quarter. Two class meetings each week. General prerequisites must include elementary courses in geography or fifteen hours of allied subjects. Mr. Huntington.

Geographic influences in the history of the state. Ohio's agriculture, industries, and social conditions, together with the underlying physical, climatic, and other environmental factors that have contributed to the present development of the region.

***611. Cartography and Map Interpretation.** Three credit hours. Winter Quarter. Three class meetings each week. Given in alternate years. General prerequisites must include elementary courses in geography or ten hours of allied subjects. Mr. Smith.

The interpretation and appreciation of maps. A consideration of scales, symbols, and the common map projections. The representation of geographic data by the use of dots, isopleths, cartograms, and other graphic devices. A survey of the various maps published by the United States and other map-issuing institutions.

615. Climatology. Three credit hours. Autumn Quarter. Three class meetings each week. General prerequisites must include fifteen hours in natural or social science, including courses in one of the following: geography, meteorology, botany, or agronomy. Mr. Smith.

Elements of climate and their distribution. The controls of climate. Types of climate and their distribution with particular reference to agricultural production, natural vegetation and the major soil groups. Concluded by a consideration of the recent thought on the subject of climatic regions and their boundaries.

621. Geography of Europe. Three credit hours. Autumn Quarter. Three class meetings each week. General prerequisites must include elementary courses in geography. Open to graduate students majoring in economics, history, political science, or sociology. Mr. Van Cleef.

The geographic factor in the economic, social, and political progress of the nations. Current major problems of the continent in the light of their geographic background. Consideration given to some geopolitical problems.

Given in the Summer of 1943.

624. Geography of Latin America. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include elementary

* Not given in 1943-1944.

courses in geography. Open to graduate students majoring in economics, history, political science, or sociology. Mr. Carlson.

Geographic regions of Mexico, Central America, the West Indies, and South America. The development of the political divisions in relation to their geographic conditions. Special emphasis is placed on the geographic analysis of Inter-American affairs.

625. Geography of the Far East. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include elementary courses in geography. Open to graduate students majoring in economics, history, political science, or sociology. Mr. McCune.

The major geographic divisions of the monsoon lands of Asia and its insular fringe including Australasia. Particular attention is given to the regions of densest population and greatest economic importance. Consideration of intra- and inter-regional relationships.

631. The Historical Geography of Commerce. Three credit hours. One Quarter. Autumn and Spring. Three class meetings each week. General prerequisites must include elementary courses in geography or in history. Mr. Peattie.

Geographic factors in commerce to 1800. Resources and production in the ancient and medieval world. Trade routes in relation to exchange of ideas. Geographic elements in the early origin of many present-day commercial practices.

Given in the Summer of 1943.

633. The Geography of Modern Commerce. Three credit hours. Autumn Quarter. Three class meetings each week. General prerequisites must include elementary courses in geography. Mr. Carlson.

Unequal distribution of natural resources and differences in industrial and social development as basic factors in interregional trade. A consideration of the major raw materials and other important commodities in international commerce. Geographic factors in the establishment and development of trade routes. Concluded with a discussion of major trade areas.

634. Geography of Cities. Three credit hours. One Quarter. Winter and Spring. Three class meetings each week. General prerequisites must include elementary courses in geography. Mr. Van Cleef.

Geographic factors in the origin and growth of urban centers. Analysis and synthesis of the economic and physical structure and functions of trade centers in the light of their geographic setting; areal expansion; intra- and inter-trade center relations; integration with avenues of communication; occasional field trips.

651. Anthropogeography. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include courses in elementary geography or history. Mr. Peattie.

Advanced social geography. The geographic factor in cultural evolution. A course giving attention to the individual interests of students in geography, education, history, and sociology.

700. Field Work in Geography. Two credit hours. Spring Quarter. General prerequisites must include twelve hours of geography. Given in alternate years. Mr. Smith Mr. McBryde.

A course in the practice of field observation and geographic mapping.

750. Proseminar in Foreign Commerce. Two or three credit hours. Spring Quarter. One two-hour class period each week. Occasional field trips. Mr. Van Cleef.

Consideration of the leading contributors, and their philosophies, to the development of the foreign commerce of the United States; a summary discussion of the fundamentals underlying applied foreign commerce; field work involving the class as a group and independently by individual members; a review of current literature.

799. Special Problems in Geography. Two to five credit hours. Autumn, Winter, and Spring Quarters. Assigned readings, conferences, and reports. General prerequisites must include eighteen hours of geography and consent of the instructor must be obtained.

(a) Problems in Physical Geography. Mr. Peattie, Mr. Carlson, Mr. Smith.
(b) Problems in Climatology. Mr. Smith, Mr. Peattie.
(c) Problems in Political and Historical Geography. Mr. Huntington, Mr. Peattie, Mr. Van Cleef.
(d) Problems in Economic and Commercial Geography. Mr. Huntington, Mr. Van Cleef, Mr. Carlson, Mr. Wright.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

811. History of Geography. Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include eighteen hours of geography. Given in alternate years. Mr. Van Cleef, Mr. Peattie.

Readings in the classics. The history of the development of geographic theories. Modern tendencies as seen in current literature.

850. Seminar in Geography. Two credit hours. Not more than two seminars to be given each Quarter. Subject to be announced each Quarter.

Given in the Summer of 1943.

950. Research in Geography. Autumn, Winter, and Spring Quarters.

Research work in historical and political geography will be conducted under the direction of Mr. Huntington and Mr. Peattie; in geography of conservation and land utilization under the direction of Mr. Huntington and Mr. Carlson; in physical geography and climatology under the direction of Mr. Peattie and Mr. Smith; in commercial and urban geography under the direction of Mr. Huntington and Mr. Van Cleef.

Conference, assigned problems, and reports.

Given in the Summer of 1943.

GEOLOGY†

Offices, 103, 104 Orton Hall

PROFESSORS CARMAN, SPIEKER, AND WHITE, ASSOCIATE PROFESSOR STEWART, ASSISTANT PROFESSORS COLE AND LAMEY, MR. STOUT, MR. FULLER, MR. WELLS

Prerequisites for Graduate Work: Students intending to take graduate work in geology should preferably have made geology a major undergraduate study, and in any event should have completed at least thirty Quarter hours (twenty semester hours) of work in geology and mineralogy, with supporting work in chemistry and mathematics (at least through trigonometry), and, if possible, in physics and biology also.

Students whose training falls short of these specifications are not debarred from entrance into graduate work, but the time spent making up deficiencies cannot normally be accredited as work done toward the graduate degree.

All candidates for advanced degrees must have had field experience at least equivalent to that afforded by the field course offered by this department. Entering students who lack such experience are urged to take Geology 627 or its equivalent elsewhere during the summer preceding entrance into the regular academic year.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. Advanced General Geology: Physiography. Five credit hours. Autumn Quarter. Four class meetings and one two-hour laboratory period each week. Saturday mornings must be kept open for field trips. General prerequisites must include elementary courses in geology or geography. Mr. Cole.

A detailed study of the processes at work on the land surface and the topographic forms produced by them. This course includes practice in the interpretation of topographic maps.

602. Advanced General Geology: Structural and Dynamic. Five credit hours. Winter Quarter. Four class meetings and one two-hour laboratory period each week. General prerequisites must include Geology 601. Mr. Spieker.

A detailed study of the structural features of the earth's crust and of the forces which have produced these structures. This course includes practice in the interpretation of geological maps and in various measurements and computations.

603. Advanced General Geology: Historical. Five credit hours. Spring Quarter. Four class meetings and one two-hour laboratory period each week. Saturday mornings must be kept open for field trips. General prerequisites must include Geology 602. Mr. Carman, Miss Stewart.

A study of the geological history of North America, its physical history, and life develop-

† For courses in mineralogy and petrography see the Department of Mineralogy.

ment. The course deals with the classification and distribution of the geological formations, especially those of Ohio, and with the characteristic fossils of each system.

605. Economic Geology: Metals. Five credit hours. Autumn Quarter. Five class meetings or lectures each week. General prerequisites must include elementary courses in mineralogy. Mr. Lamey, Mr. Fuller.

A study of the nature of ores, their classification and origin; the metallic deposits.

606. Economic Geology: Non-Metals and Coals. Three credit hours. Winter Quarter. Three class meetings or lectures each week. General prerequisites must include elementary courses in mineralogy. Mr. White.

A study of non-metallic materials except petroleum. Origin, properties, classification, and distribution of the industrial minerals and rocks, and coal, with special emphasis on the coals of Ohio.

607. Economic Geology: Petroleum. Five credit hours. Spring Quarter. Four class meetings and one two-hour laboratory period each week. General prerequisites must include four Quarters of geology or of geology and mineralogy. Mr. White, Mr. Lamey.

A study of the origin, geologic occurrence, and distribution of petroleum, natural gas, and the solid bitumens.

608. Stratigraphic Geology of Ohio. Five credit hours. Autumn Quarter. Given in alternate years. Permission of the instructor must be obtained. Mr. Carman.

Field trips with reports, lectures, and assigned readings. Field trips on Saturdays (entire day) while the weather permits.

The geological formations of Ohio are studied in the field, by rock specimens, and by assigned readings. This course is intended to acquaint the student with the rock formations of Ohio.

609. Petrology. Five credit hours. Winter Quarter. Five class meetings and one two-hour laboratory period each week. Given in alternate years. General prerequisites must include elementary courses in mineralogy. Mr. Lamey.

A study of the occurrence, association, chemical relationships, and distribution of rocks, with laboratory study in rock identification.

***610. Physiography of the United States.** Five credit hours. Winter Quarter. Five class meetings each week. Given in alternate years. General prerequisites must include Geology 601. Mr. Cole.

A study of the physiographic regions of the United States. The topographic form and physiographic history with the geologic history as a background. Designed to give the student of geology or geography a working knowledge of the physiography of the United States.

612. Special Problems. Three to five credit hours. All Quarters. Assigned readings, conferences, and reports.

A study of special topics by conferences and reports. Laboratory, library or field work.

Properly qualified students may carry on work in stratigraphy, sedimentation, structural geology, economic geology, petrology, opaque ore mineral studies, paleontology and physiography under the direction of the appropriate members of the department.

Given in the Summer of 1943.

***613. Glacial Geology.** Three credit hours. Autumn Quarter. Certain Saturdays must be kept open for field trips. Given in alternate years. General prerequisites must include elementary courses in geology and preferably Geology 601. Mr. Cole.

A study of the glacial geology of North America, with special emphasis on the glacial problems of Ohio.

***615. Geological Surveying.** Five credit hours. Spring Quarter. Three class meetings and two field or laboratory periods each week. Given in alternate years. Permission of the instructor must be obtained. Class limited to ten. Mr. Spieker, Mr. Fuller.

A study of the construction and interpretation of topographic and geologic maps, with special emphasis on instrument work and map making. Field practice in various methods of

* Not given in 1943-1944.

triangulation, traversing, and topographic sketching. Instruments used include plane table, telescopic alidade, open sight alidade, aneroid barometer, paulin altimeter, hand level, stadia, and compass.

616. Clays. Five credit hours. Winter Quarter. Five class meetings each week. General prerequisites must include a course in chemistry. Mr. Stout.

The properties, distribution, uses, and origin of clays. Emphasis will be given to the clays of Ohio.

620. Introductory Paleontology. Three credit hours. Autumn Quarter. Two class meetings and one two-hour laboratory period each week. General prerequisites must include a course in historical geology. Mr. Carman, Miss Stewart.

A study of the systematic classification of the animal kingdom as a means of becoming acquainted with the faunas that characterize the various geological formations. The course deals mainly with the generic characters of the fossil invertebrates and their use in identifying and correlating geological formations.

621. Introductory Paleontology. Three credit hours. Winter Quarter. Mr. Carman, Miss Stewart.

A continuation of Geology 620.

622. Introductory Paleontology. Three credit hours. Spring Quarter. Mr. Wells, Mr. Carman.

A continuation of Geology 621 but dealing with the paleontology of fossil plants and vertebrates.

623. Micro-Paleontology. Three credit hours. Spring Quarter. Laboratory work conducted by conference. Given in alternate years. General prerequisites must include Geology 620-621-622. Miss Stewart, Mr. Cole.

A study of fossil microorganisms, especially the foraminifera. The course is designed to give a general knowledge of the structure, habits, taxonomic relationships, and phylogenetic development of these organisms. Methods of study commonly practiced in commercial laboratories, and the use of microorganisms in determining geologic correlation, especially in oil drillings, are stressed in the laboratory work.

627. Field Geology. Eight credit hours. Summer Quarter. First term. General prerequisites must include Geology 601-602-603 or equivalent. Permission of the instructor must be obtained. Limited to men. Mr. Cole, Mr. Spieker.

This course offers training in the standard methods of geologic field work. It is conducted from a fixed field camp on the rim of the Cumberland Plateau, near Dayton, Tennessee, and employs the entire time of the students. The field for study is the Appalachian region of eastern Tennessee, which offers considerable variety in physiographic, stratigraphic, structural, and economic geology. The course begins about June 20 and continues five weeks, after which a report will be prepared by each student and submitted by the following December first.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION." page 45.

If the student intends to specialize in paleontology he must have had in addition courses in zoology; if in inorganic geology, courses in chemistry, physics and mineralogy; if in physiography, courses in physics, chemistry, and geography.

*801-*802-*803. Advanced Historical Geology. Three credit hours. Autumn, Winter, and Spring Quarters. Three lectures each week. Given in alternate years. Mr. Carman, Mr. Spieker.

A study of the physical history of the North American continent and of the life development which has taken place upon it. The lithology, subdivisions, geographical distribution, and fossils of each system are studied and from these the geological history of the time is interpreted.

807. Advanced Paleontology. Three or four credit hours each Quarter. Autumn, Winter, Spring. Individual laboratory work conducted by conference. A student may enter at the beginning of any Quarter. General prerequisites must include Geology 620, 621, and 622. Miss Stewart, Mr. Wells.

The identification and study of typical faunas from various geologic formations, with particular reference to those of Ohio.

* Not given in 1943-1944.

810. Geology of the Eastern United States. Three credit hours. Winter Quarter. Lectures, readings, conferences. Given in alternate years. General prerequisites must include acceptable courses in historical and structural geology. Mr. Carman.

A review of the important stratigraphic and structural features of the Eastern United States. Special attention is given to the correlation of the important formations, the major structures and the paleogeography of the region.

811. Geology of the Western United States. Three credit hours. Spring Quarter. Lectures, readings, conferences. Given in alternate years. General prerequisites must include acceptable courses in historical and structural geology. Mr. Spieker.

A review of the important stratigraphic and structural features of the Western United States, as exemplified by the Cordilleran region. Special attention is given to the correlation of the important formations, the major structures, and the paleogeography.

812. Principles of Sedimentation and Stratigraphy. Three credit hours. Spring Quarter. Three lectures each week. Given in alternate years. General prerequisites must include courses in advanced general geology. Mr. Spieker.

The origin, constitution, and relationships of stratified rocks; an approach to the outstanding problems of stratigraphy, in which attention is given chiefly to processes of sedimentation and their results, the interpretative study of sedimentary rocks, and the general problems of correlation.

Not open to students who have credit for Geology 618.

***813. Sedimentary Petrography I.** Three credit hours. Spring Quarter. One lecture and six hours of laboratory work each week. Given in alternate years. General prerequisites must include courses in advanced general geology. Mr. Spieker.

The theory and application of various techniques in the laboratory study of sediments and sedimentary rocks. Mechanical analysis, determination of fundamental physical characters of sedimentary materials. Statistical procedures for representation of results. The problem of interpretation; possible uses of the various laboratory data in determining conditions of origin and in other concerns of the stratigrapher such as correlation.

814. Sedimentary Petrography II. Three credit hours. Spring Quarter. Nine hours of laboratory work each week. Given in alternate years. General prerequisites must include Mineralogy 621 or its equivalent. Mr. Lamey.

Laboatory preparation of clastic sedimentary rocks for microscopic examination, the microscopic study of the component fractions of such rocks, and the interpretation of results.

815. Seminar in Metamorphism. Two credit hours. Autumn Quarter. General prerequisites must include Geology 609. Mr. Lamey.

A study of the processes of metamorphism, with a critical analysis of the rock types produced.

816. Seminar in Structural Geology. Two credit hours. Winter Quarter. Mr. Spieker.

Conferences for the discussion of problems in geologic structure as exemplified and developed in selected mountain regions.

817. Seminar in Earth Tectonics. Two credit hours. Spring Quarter. Mr. Spieker.

Conferences covering the broader and more fundamental problems of earth structure, involving chiefly the nature and origin of crustal forces.

950. Research in Geology. Autumn, Winter, and Spring Quarters. Field, laboratory and library study. General prerequisites must include acceptable courses in the field chosen. Consent of the instructor must be obtained.

Research in stratigraphy and structural geology is conducted under the supervision of Mr. Carman, Mr. Spieker, and Mr. White; in paleontology under Mr. Carman, Miss Stewart and Mr. Wells; in sedimentation under Mr. Spieker; in economic geology and petrology under Mr. Lamey, and in geomorphology under Mr. Cole.

* Not given in 1943-1944.

GERMAN

Office, 213 Derby Hall

PROFESSORS EVANS, EISENLOHR (EMERITUS), MAHR, AND SPERBER, ASSOCIATE PROFESSOR GAUSEWITZ, ASSISTANT PROFESSORS THOMAS (EMERITUS), NORDSIECK, AND KRAMER

Prerequisites for Graduate Work: Candidates for advanced degrees must present on admission to the graduate field an undergraduate major in German from a recognized college or its equivalent.

Requirements for the Master's Degree: Generally speaking one full year will suffice for the Master's degree, but each case will be considered individually by the department. At least fifteen hours in 800 courses will be required and about one-half of the work divided between linguistic and advanced practice courses. Wide reading in classical and modern literature is essential.

Requirements for Ph.D. Degree: For the doctorate the major may be selected from the literary or the linguistic field, with about two-thirds of the work assigned to the major field and one-third to the minor.

Candidates for the doctorate in German must present a knowledge of a Romance language which is the equivalent of at least two courses in the "600" group, or a working knowledge of either Latin or Greek.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

Proseminar: Eighteenth and Nineteenth Century Literature. Three credit hours. Autumn, Winter, and Spring Quarters. Three hours lecture and quiz each week. General prerequisites must include six Quarters of German or equivalent. The courses are presented below in a three-year cycle.

1943-1944:

614. Autumn Quarter, 1943. Goethe's Prose. Mr. Evans.

629. Winter Quarter, 1944. Gottfried Keller. Mr. Gausewitz.

642. Spring Quarter, 1944. Thomas Mann. Mr. Mahr.

1944-1945:

608. Autumn Quarter, 1944. Lessing. Mr. Mahr.

622. Winter Quarter, 1945. Schiller. Mr. Evans.

623. Spring Quarter, 1945. Kleist. Mr. Gausewitz.

1945-1946:

641. Autumn Quarter, 1945. Hauptmann. Mr. Gausewitz.

632. Winter Quarter, 1946. Hebbel. Mr. Mahr.

612. Spring Quarter, 1946. Goethe's Faust. Mr. Evans.

German 642 given in the Summer of 1943.

***656. Introduction to the Historical Study of German.** Three credit hours. Autumn Quarter. Three hours lecture and drill each week. General prerequisites must include six Quarters of German or equivalent. Mr. Sperber.

Elements of phonetics. Relations between German and English phonology. Survey of the history of the German language.

***673. Elementary Middle High German.** Three credit hours. Winter Quarter. Mr. Sperber.

Introduction to the study of Middle High German with the reading of easy texts.
Given in the Summer of 1942.

***675. Elements of Semantics.** Three credit hours. Spring Quarter. Three hours lecture and quiz each week. Mr. Sperber.

Studies in German words and the development of their meaning.

*** Not given in 1943-1944.**

*685. **Advanced Composition.** Three credit hours. Spring Quarter. Three hours lecture and quiz each week. General prerequisites must include at least six Quarters of German. Mr. Kramer.

An advanced course in speaking and writing German, accompanied by a review of German syntax.

*691. **Practical German Pronunciation.** Two credit hours. Winter Quarter. Two hours lecture and drill each week. General prerequisites must include six Quarters of German or equivalent. Mr. Kramer.

The formation of German sounds. A systematic study of the standard of German pronunciation and its chief variations. Oral and written drill. For majors, especially those who expect to teach the language.

695. **Special Problems.** Two to ten credit hours. Autumn, Winter, and Spring Quarters. Mr. Evans, Mr. Mahr, Mr. Sperber, Mr. Gausewitz.

Investigations of minor problems in the various fields of German literature and philology. Given in the Summer of 1943.

705. **Principles of the Historical Study of Language.** Three credit hours. Spring Quarter. Three lectures each week. Mr. Sperber.

The elements of linguistic science, together with an outline of the Indo-European family of languages.

Not open to students who have credit for Greek 701.

NOTE: TEACHING COURSES. For the Teaching Course in this department see the Department of Education, Course 690.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

801. **Advanced Middle High German.** Three credit hours. Autumn Quarter. Mr. Sperber.

The reading of more difficult Middle High German texts. Methods of textual criticism.

805. **Gothic.** Three credit hours. Winter Quarter. Mr. Sperber.

Given in the Summer of 1943.

810. **Old High German.** Three credit hours. Spring Quarter. Mr. Sperber.

821-822-823. **Survey of Earlier German Literature.** Three credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include graduate standing. Mr. Nordsieck.

This course is intended primarily to afford first-year graduate students an opportunity for wide reading in the general field of German literature or for intensive reading in specific periods. Informal discussion and written reports.

Not open to students who have credit for German 601-602-603.

860. **Seminar in German Literature.** Five credit hours. Autumn, Winter, and Spring Quarters. The courses are presented below in a three-year cycle.

1943-1944:

Autumn Quarter. The German Novelle. Mr. Gausewitz.
Winter Quarter. History of the Novel. Mr. Mahr.
Spring Quarter. German Medieval Drama. Mr. Evans.

1944-1945:

Autumn Quarter. Drama of the Classical Period and Romanticism. Mr. Gausewitz.
Winter Quarter. Drama of the Nineteenth Century. Mr. Mahr.
Spring Quarter. The English Comedians in Germany. Mr. Evans.

1945-1946:

Autumn Quarter. Schiller's Letters. Mr. Evans.
Winter Quarter. Sturm und Drang. Mr. Gausewitz.
Spring Quarter. Goethe's Lyrics. Mr. Mahr.

Given in the Summer of 1943.

* Not given in 1943-1944.

870. Seminar in German Linguistics. Three credit hours. Autumn, Winter, and Spring Quarters. Mr. Sperber.

Ausgewählte Gegenstände aus den Gebieten der Wortgeschichte, der Stilforschung und der Sprachpsychologie.

950. Research in German. Autumn, Winter, and Spring Quarters. Mr. Evans, Mr. Mahr, Mr. Sperber, Mr. Gausewitz.

Given in the Summer of 1943.

GREEK LANGUAGE AND LITERATURE

(See Classical Languages and Literature)

HISTORY

Office, 211 University Hall

PROFESSORS WASHBURNE, SIEBERT (EMERITUS), McNEAL, HOCKETT (EMERITUS), HILL, DORN, McDONALD, WOODRING, AND DULLES, ASSOCIATE PROFESSORS ROSEBOOM, WEISENBURGER, SIMMS, AND GRIMM, ASSISTANT PROFESSORS HARE, LANDIN, AND FISHER

Requirements for the Master's Degree: In addition to the general requirements, the Department of History requests that each candidate for the degree Master of Arts should have History 812 or its equivalent and two seminars in history.

DEPARTMENTAL REQUIREMENTS for the DEGREE of DOCTOR of PHILOSOPHY:

A. Notice of Candidacy. Students who expect to become candidates for the degree of Doctor of Philosophy should make known their intentions not later than the beginning of the first Quarter of the second year of graduate work.

From the list below, each student will select and enter upon an application form which may be obtained from the office of the department, five fields of history and one field of allied knowledge. Three of the history fields must be selected from Group A and two from Group B or three may be selected from Group B and the other two from Group A. One of the fields of history shall be designated as the dissertation field. The sixth field must be selected from Group C.

B. Fields of Choice:

GROUP A

Ancient Near East and Greece
Roman History
Medieval History
Era of the Renaissance and Reformation
Era of the Absolute Monarchy and French Revolution
Europe since 1815
European Diplomacy since 1878
England to 1603
England and Greater Britain since 1603
Expansion of Europe

GROUP B

Colonial Era of the Western Hemisphere
Political and Social History of the United States through the Civil War
Political and Social History of the United States since the Civil War
Slavery Controversy and Post-Bellum South
Constitutional History of England and the United States
Greater Republics of Latin America
American Foreign Relations

GROUP C

An approved field in anthropology, economics, political science, philosophy, literature, or other allied subject

C. Foreign Languages. Except in special cases, a reading knowledge of French and German is required of every candidate for the degree of Doctor of Philosophy in history. In special cases, the department may consent to the substitution of another language for French or German. In such cases the language selected as a substitute must have a clear bearing upon the candidate's field of research.

D. The General Examination. The candidate will be required to take examinations in all five of the selected fields of history and in the allied field. All candidates for the degree of Doctor of Philosophy are required to have had History 812 or its equivalent, and are required to

take History 813 and History 814, and at least four seminars in history, of which two must be in the field of European history and two in the field of American history.

Candidates for the Doctor of Philosophy degree in history should read the general requirements for this degree as given on page 45.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include at least four Quarters in the social science field, of which at least two must be in history.

See page 59 for the program in Ancient History and Literature.

607. The Renaissance. Three credit hours. Autumn Quarter. Three class meetings each week. Mr. Grimm.

The Renaissance primarily as an Italian movement. The political evolution of the Italian communes into city republics, with special emphasis on Florence, Milan, Venice, Genoa, and Rome; early capitalism and industrial and commercial movements; an analysis of the culture, art, science, and literature of the Renaissance and their influence upon the Church, the Papacy, and modern modes of thought and behavior. Lectures, readings, reports, and discussions.

608. The Reformation. Three credit hours. Spring Quarter. Three class meetings each week. Mr. Grimm.

The Church and European society in the later Middle Ages; culture and thought in the age of the Reformation; the rise of the European state system; Luther and the German National movement; Zwingli and Switzerland; Calvin; the expansion of Protestantism in Europe; and the relation of the Reformation to medieval and modern civilization. Lectures, readings, reports

611. Constitutional History of England (to 1485). Three credit hours. Autumn Quarter. Three class meetings each week. General prerequisites must include History 682 or consent of the instructor. Mr. Woodring.

The development of an effective royal administration, rise of common law and system of courts, dawn of representative institutions, completion of basic institutions and tradition of constitution by 1485. Lectures, textbook, source problems, collateral readings.

612. Constitutional History of England (since 1485). Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include History 611 or consent of the instructor. Mr. Woodring.

The Tudor system, the struggle between king and parliament, cabinet government, electoral reform, and the law of the modern constitution. Lectures, textbook, source problems, collateral readings.

617. The Absolute Monarchy (1650-1789). Three credit hours. Spring Quarter. Three class meetings each week. Mr. Grimm.

This course offers a study of the transformation of feudal society into the modern absolute state in its social, economic and constitutional aspects, as exemplified in France, Spain, Austria, Prussia, and Russia. Special emphasis will be placed on France under Louis XIV, on the evolution of Prussia and Russia, the changing diplomatic alignments of the principal European Powers from 1660 to 1789, on the intellectual enlightenment of the eighteenth century and Enlightened Despotism. Readings, discussions, and reports.

619. Medieval Civilization. Three credit hours. Autumn Quarter. Three class meetings each week. General prerequisites must include a major in history. Advanced students from other departments without this prerequisite admitted only with consent of the instructor. Mr. McNeal.

The formation of feudal society; culture of castle and court; the rise of towns and their social and economic life; the evolution of the Medieval Church and its educational and artistic contributions. Lectures, readings, problems, and class discussion.

621. Expansion of Europe (to 1588). Three credit hours. Autumn Quarter. Three class meetings each week. Advanced students from other departments admitted only with the consent of the instructor. Mr. Washburne.

A study of the early geographical ideas of the Europeans, their first contact with the outside world, the period of discovery, the creation of the Portuguese empire in the east and the Spanish monopoly in the west, to the collapse of the Iberian control of European expansion by the destruction of the Armada in 1588. Lectures, readings, and discussions.

622. Expansion of Europe (1588 to 1815). Three credit hours. Winter Quarter. Three class meetings each week. Advanced students from other departments admitted only with the consent of the instructor. Mr. Washburne.

A study of the rise of the chartered trade companies, the ascendency of the Dutch, the

contest between the Dutch and the English for commercial supremacy and the long struggle between the English and the French for maritime supremacy, with its resultant effects upon India and North America through the settlement at the end of the Napoleonic era. Lectures, readings, and discussions.

623. Expansion of Europe (1815 to the Present). Three credit hours. Spring Quarter. Three class meetings each week. Advanced students from other departments admitted only with the consent of the instructor. Mr. Washburne.

A study of the problems of expansion in the nineteenth and twentieth centuries; the development of India; the movement into the Southern Pacific; the partition of Africa and the various phases of modern imperialism after 1876, through the readjustment of territory under the mandate system after the World War. Lectures, readings, and discussions.

624. The French Revolution and Napoleon. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include a major in history. Advanced students from other departments admitted only with the consent of the instructor. Mr. McNeal.

Discussion of ideas and conditions in France preceding the Revolution; course of the Revolution, 1789-1795, with emphasis on the Reign of Terror; results of the Revolution as the basis of modern France; more rapid sketch of events, 1795-1815; the Directory; the Revolutionary wars and rise of Napoleon Bonaparte; the Napoleonic Empire. Textbook, lectures, discussion, readings (including memoirs of the time).

Given in the Summer of 1943.

625. Modern France (since 1815). Three credit hours. Spring Quarter. Three class meetings each week. General prerequisites must include a major in history. Advanced students from other departments admitted only with the consent of the instructor. Mr. McNeal.

Emphasis on internal history of the Third Republic, after introductory sketch of movements from 1815 to 1870. Formulation of republic program in the late Second Empire, founding of the Republic; political developments, 1876-1914; France after the war; the "fall of France." Lectures, discussion, readings.

Given in the Summer of 1943.

†626. The Near Eastern Question (1815 to the Present). Three credit hours. Spring Quarter. Three meetings each week. Mr. Fisher.

A study of the conflicting national and international problems which resulted in the disintegration of the Ottoman Empire, the formation of the Balkan States and the development of the present Turkish national government with its role in European affairs. Lectures, readings, discussion.

Given in the Summer of 1943.

629. Modern Germany (1789-1918). Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include elementary history courses. Advanced students from other departments without these prerequisites must obtain the consent of the instructor. Mr. Grimm.

Introductory lectures on the basic problems and tendencies of German history; Germany and the French Revolution; German Enlightenment and Romanticism and their relation to political thought; the Stein-Hardenberg reforms and the war of liberation; Prussia, Austria and the problem of German unity; the nationalist and democratic movements; the Bismarckian Empire; industrial development; William II and the World War; the German Revolution of 1918. Lectures, readings, reports, and discussions.

630. The Diplomacy of Europe (1878-1919). Three credit hours. Autumn Quarter. Three class meetings each week. General prerequisites must include a major in history. Advanced students from other departments admitted only with the consent of the instructor. Mr. Washburne.

A study with the use of the new material now available, of the diplomatic obligations of the European states from the Congress of Berlin of 1878 to the Paris Conference of 1919; the formation of alliances, the crises which culminated in the war, and the attitude of European leaders. Lectures, readings, and discussions.

631. Constitutional History of the United States (to 1826). Three credit hours. Autumn Quarter. Three class meetings each week. Mr. Dulles.

The purpose of this course and the others in this sequence is to exhibit our constitutional system as a growth resulting from the actual experiences of our people. The first Quarter deals

† Not given during the academic year, 1943-1944.

with the antecedents of the Constitution, the work of the Federal Convention of 1787, and the problems encountered in carrying on government under the Constitution, to the close of the War of 1812.

632. Constitutional History of the United States (1826-1876). Three credit hours. Winter Quarter. Three class meetings each week. Mr. Dulles.

A continuation of History 631, covering the reaction which led to the nullification episode and the Civil War and ending with a consideration of the problems of reconstruction. For a continuation of this course, see History 688.

633. The Slavery Controversy in the United States. Three credit hours. Autumn Quarter. Three class meetings each week. Mr. Simms.

The origins of the institution of slavery; the social system of the old South; the psychological, economic, political, and constitutional implications of the controversy; secession, and the appeal to arms. Lectures, readings, and discussions.

Given in the Summer of 1943.

634. Reconstruction and the New South (1863-1943). Three credit hours. Winter Quarter. Three class meetings each week. Mr. Simms.

The controversy over reconstruction plans; the triumph of the industrial order; the social and economic readjustments in the Southern States during and after the period of reconstruction. Lectures, readings, and discussions.

Given in the Summer of 1943.

635. American Diplomacy to the Close of the Civil War. Three credit hours. Autumn Quarter. Three class meetings each week. Mr. Hill.

The foreign relations of the United States, beginning with the diplomacy which resulted in the establishment of independence and including such subjects as the struggle for neutral rights and commercial recognition, the extension of territory on the continent, the origin of the Monroe Doctrine, and the international controversies of the Civil War. Lectures, discussions, and reports.

636. American Diplomacy since the Civil War. Three credit hours. Winter Quarter. Three class meetings each week. Mr. Hill.

Problems in the diplomacy of the United States resulting from the Civil War, the development of the Monroe Doctrine, the acquisition of dependencies, relations with Latin America and the Orient, arbitration, the Isthmian Canal, and neutral rights during the Great War in Europe. Lectures, discussions, and reports

637. Recent History of the United States (1875-1917). Three credit hours. Autumn Quarter. Three class meetings each week. Mr. Dulles.

A study by the topical method of political, economic, social, and constitutional problems, with a special attempt at interpretation. Lectures, collateral readings, and reports.

Given in the Summer of 1943.

638. Recent History of the United States (since 1917). Three credit hours. Winter Quarter. Three class meetings each week. Mr. Dulles.

This course is the logical continuation of History 637 but may be taken separately. The method of presentation and the general topics treated are the same as for History 637. Lectures, collateral readings, and reports.

Given in the Summer of 1943.

639. The Influence of Immigrant Groups upon United States History. Five credit hours. Spring Quarter. Five class meetings each week. Mr. Weisenburger.

The share of different immigrant groups in the building of the nation, from the colonial period to the present; with special emphasis on the influence of immigration upon American political, economic, social, and cultural development. Lectures, readings, and discussions.

***640. The Westward Movement (to 1840).** Three credit hours. Autumn Quarter. Three class meetings each week. Mr. Hockett.

This course, together with History 641, follows the expansion of settlement of the people of the United States westward from the Atlantic coast, picturing the life of the pioneers and the rise of new communities, and tracing their influence upon national development. Lectures, discussions and reports.

***641. The Westward Movement (since 1840).** Three credit hours. Winter Quarter. Three class meetings each week. Mr. Hockett.

A continuation of History 640.

* Not given in 1943-1944.

643. Political Parties in the United States. Five credit hours. Spring Quarter. Five class meetings each week. Mr. Roseboom.

The radical party of the Revolution; the origin and growth of national parties; the slavery issue in party politics; the effect of the Civil War upon parties; party development in recent American history, special attention being devoted to the influence of the new economic and social conditions in creating new parties and policies. Lectures, readings, discussions, and reports.

644. The Colonization of North America. Three credit hours. Spring Quarter. Three class meetings each week. Mr. Roseboom.

A survey of the transplanting of European culture and institutions to North America. Colonizing methods of the leading colonial powers will be considered as well as the expansion of their colonies and the resulting international struggle for supremacy, with special emphasis upon English colonization and institutional development. Lectures, readings, reports, and discussions.

645. Latin America. Three credit hours. Winter Quarter. Three class meetings each week. Mr. Hill.

The European background; native cultures of the New World; conquest and settlement; political, social, and economic institutions; the wars for independence. This course affords a natural introduction to History 646. Lectures, readings, and discussions.

646. Latin America. Five credit hours. Spring Quarter. Five class meetings each week. Mr. Hill.

The evolution of the A B C powers and Mexico, with minor consideration of the other republics; major problems of an inter-American and an international nature. This course is a logical continuation of History 645. Lectures, readings, and discussions.

647. History of Canada. Five credit hours. Spring Quarter. Five class meetings each week. Mr. Weisenburger.

An intensive study of Canadian history with special emphasis on the relations of Canada with the United States and with the mother country, and the comparison of Canadian institutions and problems with our own. Lectures, textbook, collateral readings, and discussions.

Given in the Summer of 1943.

†649. Greek Civilization. Three credit hours. Winter Quarter. Three class meetings each week. Mr. McDonald.

A study of the contributions of Greece to Western civilization; political institutions, law, religion, drama, literature, science, and philosophy. Lectures, readings, and discussions.

Given in the Summer of 1943.

650. Roman Civilization. Three credit hours. Autumn Quarter. Three class meetings each week. Mr. McDonald.

A study of Roman contributions to Western civilization; political institutions, Roman law, religions in the Roman Empire with special reference to Christianity, slavery, agriculture, economic life, etc. Lectures, readings, and discussions.

Given in the Summer of 1943.

*653. The Ancient History of the Near East. Three credit hours. Spring Quarter. Three class meetings each week. Mr. McDonald.

A survey of the history of Egypt, Sumer, Akkad, Babylon, and Assyria. Lectures, readings, and reports.

654. The Age of the Crusades. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include a major in history. Advanced students from other departments admitted only with the permission of the instructor. Mr. McNeal.

Conditions in western Europe preceding the First Crusade, influence of the early crusading movement on the development of western Europe in the twelfth century, contemporary accounts of the Crusades. Readings, lectures, and reports on contemporary sources.

655. Greek History. Five credit hours. Autumn Quarter. Five class meetings each week. Mr. McDonald.

An intensive study of Greece, with a brief introductory survey of the ancient civilization of the Near East. Lectures, readings, reports, and discussions.

*656. Roman History. Five credit hours. Winter Quarter. Five class meetings each week. Mr. McDonald.

This course is the natural continuation of History 655. Lectures, readings, reports, and discussions.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

682. History of England, Medieval Period (to 1485). Three credit hours. Autumn Quarter. Three meetings each week. General prerequisites must include a course in the history of the Middle Ages or consent of the instructor. Mr. Woodring.

History 682, 683, 684 constitute an interdependent sequence in which the history of England and Greater Britain, socially considered, is rapidly surveyed from the earliest times to our own day. The aim of the course is to give a connected narrative, in terms of social, economic, and political conditioning, expressed in terms of historic personalities. Particularly, the necessary background for the student of English literature and of law, will be furnished. The student will be introduced to a wide range of books, both historical and literary. Graduate students will be required to synthesize their readings into a written report.

Not open to students who have credit for History 421.

683. History of England, Tudor and Stuart Periods (1485-1714). Three credit hours. Winter Quarter. Three meetings each week. General prerequisites must include History 682 or consent of the instructor. Mr. Woodring.

Not open to students who have credit for History 421 and 422.

684. History of England, Hanoverian and Modern Period (since 1714). Three credit hours. Spring Quarter. Three meetings each week. General prerequisites must include History 683 or consent of the instructor. Mr. Woodring.

Not open to students who have credit for History 422.

***685. Cultural and Social Eighteenth Century England.** Three credit hours. Spring Quarter. Three class meetings each week. Given in alternate years. Mr. Woodring.

The society of the eighteenth century and the politics of George III, the background of the American Revolution and the struggle with revolutionary France in terms of the Industrial Revolution. Lectures, collateral readings, special investigations, and reports.

686. Contemporary England. Three credit hours. Spring Quarter. Three class meetings each week. Given in alternate years. Mr. Woodring.

Victorian England in its economic, political, and cultural phases transformed by imperialism, the Great War, and the rise of new class theory and organization. Lectures, readings, reports, informal discussions.

†688. Constitutional History of the United States (since 1876). Three credit hours. Winter Quarter. Three class meetings each week. Mr. Dulles.

A continuation of History 632, covering the constitutional problems arising from capitalism, the organization of labor, territorial expansion, the World War, and the New Deal.

This course arranged in a cycle with History 681 and 632.

Given in the Summer of 1943.

689. The History of Ohio. Three credit hours. Autumn Quarter. Three class meetings each week. Mr. Weisenburger.

A general survey of the history of Ohio—social, economic, religious, and political—from the Indian period to the present time.

Not open to students who have credit for History 437.

690. Contemporary Europe (1919-1933). Three credit hours. Winter Quarter. Three class meetings each week. Mr. Washburne.

A study of present day problems. A consideration of the phases of the attempted reconstruction of Europe following the Paris Peace Conference of 1919. This includes the issues involved in the subjects of post war diplomacy, reparations, disarmament, the new governments of Europe and the continental development until the establishment of the dictatorship in Germany.

Not open to students who have credit for History 628.

691. Contemporary Europe (since 1933). Three credit hours. Spring Quarter. Three class meetings each week. Mr. Washburne.

A continuation of History 690 but may be taken separately. Consideration will be given to the re-armed Germany and its effect upon the affairs of the world, the failure of collective security in Manchuria, Ethiopia, and Spain, the formation of the new alignments and the breakdown of the treaty of Versailles with he settlement at Munich in 1938 and its consequences.

Not open to students who have credit for History 628.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

700. Minor Problems in History. One to five credit hours. Summer, Autumn, Winter, and Spring Quarters. Open by permission of the instructor.

The course consists of individual study in some field of historical development and is designed to allow the student to work upon a problem in which he is particularly interested.

Special attention in graduate work during the academic year 1943-1944 will be given to:

(a) Latin-American Relations
(b) Recent American History
(c) Contemporary European Problems

Given in the Summer of 1943.

NOTE: TEACHING COURSES. For the Teaching Course in this department see the Department of Education, Course 678.

NOTE: For courses in far eastern history see Political Science 648 and 649.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include acceptable foundation courses of collegiate grade in European and American history, economics and political science.

812. Introduction to Historical Research. Three credit hours. Autumn Quarter. Three class meetings each week. Required of candidates for the Master's degree. Mr. Weisenburger.

A practice course dealing with the problems involved in the preparation of the Master's thesis. Should be taken during the student's first Quarter in the Graduate School.

Given in the Summer of 1943.

813. Great European Historians. Three credit hours. Winter Quarter. Required of candidates for the Doctor's degree. Mr. Grimm.

A study of the leading historical writers and schools of Europe, with selected readings from representative writers.

***814. Great American Historians.** Three credit hours. Winter Quarter. Required of candidates for the Doctors' degree. Mr. Simms.

A study of the leading American writers and schools of history.

815. Seminar in European History. Three credit hours. Autumn Quarter. History 812 must be included in the general prerequisites or taken concurrently. Mr. Washburne.

A practical course in research. Problem: Peace Conference strategy. Vienna, 1815, Paris, 1919.

816. Seminar in European History. Three credit hours. Winter Quarter. History 812 must be included in the general prerequisites or taken concurrently.

A practice course in research. Problem: Sixteenth Century Humanism. Mr. Grimm.

Given in the Summer of 1943.

817. Seminar in European History. Three credit hours. Spring Quarter. History 812 must be included in the general prerequisites or taken concurrently. Mr. McNeal.

A practice course in research. Problem: Chronicles of the Crusades.

819. Seminar in American History. Three credit hours. Autumn Quarter. History 812 must be included in the general prerequisites or taken concurrently. Mr. Hill.

A practice course in research. Problem: United States and Latin American Relations.

820. Seminar in American History. Three credit hours. Winter Quarter. History 812 must be included in the general prerequisites or taken concurrently.

A practice course in research.

Problems: (a) The Labor Movement since 1900. Mr. Dulles.
(b) The Reconstruction Period. Mr. Simms.

Given in the Summer of 1943.

* Not given in 1943-1944.

821. Seminar in American History. Three credit hours. Spring Quarter. History 812 must be included in the general prerequisites or taken concurrently. Mr. Dulles, Mr. Roseboom.

A practice course in research.
Problem: Ohio in the Period after the Civil War. Mr. Roseboom.

950. Research in History. Autumn, Winter, and Spring Quarters. Open by permission of the chairman of the department.

This course is to be used only for Master's thesis and Ph.D. dissertation work.
Given in the Summer of 1943.

HISTORY OF EDUCATION

(See Education)

HOME ECONOMICS

Office, 220 Campbell Hall

PROFESSORS GORRELL AND McKAY. ASSOCIATE PROFESSORS LEHMAN AND MORGAN, ASSISTANT PROFESSORS KENNEDY, PRESSEY, TURNBULL, DAVIS, HUGHES, RYAN, HEINER, PETZEL, LEWIS, AND MAUCK, MISS GREEN, MISS KYLE, MISS STENSWICK

In cooperation with the University Hospital, an opportunity is given for dietitian internes to schedule a sequence leading to the Master's degree. Candidates for appointment as student internes should be graduates of the four-year course of a recognized Home Economics department with a major in foods and nutrition or institution management.

Prerequisites for Graduate Work: For admission to graduate work in home economics a student must have a Bachelor's degree with a major in home economics, based on a curriculum equivalent to that of the School of Home Economics. Suitably qualified students wishing to work for a Master's degree in home economics may specialize in the following areas: foods and nutrition, textiles and clothing, household equipment, child development, institution management, home economics education. Each graduate sequence must be approved by an adviser in the chosen area of specialization.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. Clothing. Three to five credit hours. One Quarter. Autumn and Spring. Students who register for three credit hours will have one one-hour period and two two-hour periods each week. Students who register for five credit hours will have one one-hour period and one two-hour period in addition. General prerequisites must include an elementary course in clothing. Miss Ryan.

Students who register for three hours will do advanced work in designing and in construction of garments; and will study the market selection of clothing. Students who register for five hours will, in addition, give special attention to concurrent economic and social problems of the consumer in relation to clothing
Given in the Summer of 1943.

602. Textiles. Three or five credit hours. One Quarter. Autumn and Spring. Students who register for three credit hours will have two one-hour periods and one two-hour period each week. Students who register for five credit hours will have two two-hour periods in addition. Miss Petzel, Miss Turnbull.

Students who register for three hours will make a study of the selection, use, and care of fabrics. Students who register for five hours will, in addition, make chemical and physical tests to determine probable serviceability of fabrics, and suitable methods of care.
Not given after 1943-1944.
Given in the Summer of 1943.

*604. Clothing. Three credit hours. General prerequisites must include an elementary course in clothing, experience in teaching clothing or consent of instructor.

A course in clothing planned to meet the needs of teachers who wish to acquire a knowledge of the recent developments in this field.

*610. Nutrition. Three credit hours. Winter Quarter. Two one-hour periods for lecture and discussion and one two-hour laboratory period. General prerequisites must include courses in food, nutrition, agricultural chemistry, and physiology.

A consideration of recent human nutrition studies as they relate to modern concepts of nutrition. Some participation in feeding problems of the community.

611. Nutrition. Five credit hours. One Quarter. Autumn, Winter, Spring. Three meetings for class discussion and two two-hour laboratory periods each week. General prerequisites must include fundamental courses in physiology and agricultural chemistry. Miss McKay.

A study of the fundamental principles of human nutrition and their application to the feeding of individuals and groups under varying physiological and economic conditions.

Not given after 1944-1945.

Given in the Summer of 1943.

612. Nutrition. Five credit hours. Spring Quarter. Three two-hour periods each week for class discussion and laboratory; other hours to be arranged. General prerequisites must include Home Economics 610 or 611. Miss McKay.

Experience in the use of current literature as a means of following the development of modern concepts of nutrition. Problems of feeding in connection with overweight, underweight, and other abnormal conditions in which diet is an important part of the treatment.

614. Foods. Three or five credit hours. One Quarter. Autumn and Winter. Students who register for five credit hours will have three meetings for discussion and two three-hour laboratory periods each week. Students who register for three hours will have two meetings for discussion and one three-hour laboratory period each week. Miss Hughes, Mrs. Kennedy, Miss Green.

This course considers problems concerning the purchase of food and the planning and preparation of meals.

Not given after 1944-1945.

Given in the Summer of 1943.

*615. Experimental Work in Food Preparation. Five credit hours. General prerequisites must include courses in goods and agricultural chemistry.

Application of experimental methods to problems involved in the preparation of foods.

616. Nutrition of Infants and Children. Three credit hours. Winter Quarter. General prerequisites must include a course in agricultural chemistry and Home Economics 611 or equivalent. Mrs. Martha Lewis.

A study of the problems involved in the feeding of children. A review of the literature with laboratory work in planning diets. Observations will be made in the Home Economics Nursery School.

619. Household Equipment. Three credit hours. Autumn Quarter. Two hours for class discussion and one two-hour laboratory period each week. General prerequisites must include a course in household equipment. Miss Davis.

Application to home situations of the recent developments in lighting, with special emphasis on selection, care, and use of home lighting equipment.

621. Child Development. Five credit hours. One Quarter. Autumn, Winter, Spring. Four meetings for class discussion each week; three morning hours to be arranged for laboratory. General prerequisites must include a course in psychology and Home Economics 611. Students not majoring in home economics may by consent of instructor substitute another appropriate course for the home economics course as prerequisite or concurrent. Miss Morgan.

The nature, development, care, and training of the child, and the responsibility of society

* Not given in 1943-1944.

for providing for the physical, mental, and social needs of the child. The Home Economics Nursery School affords an opportunity for observation and for experience with children.

Not given after 1944-1945.

Given in the Summer of 1943.

622. **Household Equipment: Performance Testing.** Five credit hours. Winter Quarter. Two hours for lecture and three two-hour laboratory periods each week. General prerequisites must include a course in household equipment, fifteen Quarter credit hours in natural science, and twenty additional Quarter credit hours in home economics. Miss Davis.

Experimental problems on the performance of the major types of household equipment used in preparation of food, laundering and cleaning.

626. **Principles of Home Management.** Three credit hours. One Quarter. Autumn, Winter, Spring. Three periods each week for class discussion. General prerequisites must include elementary courses in economics and home economics or consent of the instructor.

A study of the management of the various resources available to the family, with a view to securing well-being and satisfaction for the members.

Not given after 1944-1945.

Given in the Summer of 1943.

627. **Laboratory in Home Management.** Five credit hours. One Quarter Autumn, Winter, Spring. Two conferences, one three-hour laboratory period each week and other laboratory hours to be arranged. Home Economics 611 and 626 or the equivalent must be included in the general prerequisites or taken concurrently. Miss Stenswick.

An application of the principles presented in other courses. Each student is provided with an opportunity to study the management of one or more homes, the needs of the student being considered.

Given in the Summer of 1943.

628. **Selection of Furnishings for the Home.** Three credit hours. Winter Quarter. Three periods each week for class discussion. General prerequisites must include elementary courses in economics and a course in home furnishing. Miss Heiner.

A study of the consumers' problems in the selection of home furnishings. Field work is arranged with retail merchants.

Given in the Summer of 1943.

630. **The Purchase of Foods for Institutions.** Three credit hours. One Quarter. Autumn, Winter, Spring. One lecture and two two-hour laboratory periods each week. General prerequsites must include Home Economics 611, 614, and elementary courses in economics. Mrs. Kennedy.

A study of purchasing food on a large quantity basis. Marketing practices studied from the standpoint of buying for institutions.

631. **Institution Cookery and Equipment.** Five credit hours. One Quarter. Autumn, Winter, Spring. Hours for discussion and laboratory to be arranged. Home Economics 630 and 632 must be taken concurrently. An engineering drawing course in house planning is recommended as a preceding course. Mrs. Kennedy, Miss Kyle.

Application of principles of cookery to large quantity preparation. A study of standardized formulas, calculation of food costs, the construction, operation and use of equipment, the writing of specifications, and the drawing of floor plans.

632. **Institution Organization and Administration.** Five credit hours. One Quarter. Autumn, Winter, Spring. Hours to be arranged. Home Economics 630 and 631 must be taken concurrently. Mrs. Kennedy, Mrs. Hull.

A study of the principles of organization and management applied to the problems of housing and feeding institution groups. Supervised experience in club service and cafeteria management.

†635. **Foods.** Three credit hours. General prerequisites must include Home Economics 611 or the equivalent.

This course considers the recent important contributions of research relative to the preparation and preservation of foods.

Given in the Summer of 1943.

644. **The Teaching of Home Economics.** Three credit hours. Winter Quarter. Mrs. Pressey.

The influence of the newer movements in secondary education on home economics. The place of home economics in the experimental secondary school programs and in such developments as integrated and unified educational offerings, core courses, and special home economics courses from a functional point of view.

Given in the Summer of 1943.

*661. **Child Development.** Three credit hours. One Quarter. Autumn, Winter, Spring. Two hours for class discussion and four morning hours to be arranged. General prerequisites must include an introductory course in child development, Sociology 600 and fifteen additional Quarter-credit hours of social science. Students not majoring in home economics may, with the consent of the instructor, substitute other courses related to the study of young children and family relations.

Application to the principles of child development to actual work with pre-school children. Appropriate guidance techniques will be discussed and used.

670. **Clothing: Fashion.** Three credit hours. Winter Quarter. Three meetings for class discussion each week. General prerequisites must include ten hours in fine arts and home economics (textiles and clothing), and ten hours in economics, sociology or history. Miss Mauck.

A study of the origin and development of the fashion movement and its relation to the manufacturing of and consumption of textiles and clothing. An analysis of sources of current fashion information, of methods and practices used in style coordination; a consideration of fashion trends, acceptances, and cycles, and their effect on the markets and the consumer.

*671. **Textiles.** Three credit hours. Spring Quarter. One hour for discussion and two two-hour laboratory periods each week. General prerequisites must include ten hours in home economics including textiles and ten hours of natural science.

In this course, the student will gain experience in planning and conducting textile tests and in evaluating the resulting data. Fibers, yarns, fabrics, and finishing agents will be studied in relation to probable durability and serviceability. Some consideration will be given to the development, present status, and importance of textile testing.

Not open to students who have credit for Home Economics 602, five hours, but open to those who have had the course for three credit hours only.

672. **Textiles: Historic.** Three credit hours. Spring Quarter. Three meetings for class discussion each week. General prerequisites must include a course in textiles, a course in fine arts, and ten hours in social socience. Miss Petzel.

Historic textiles will be studied in relation to their use in clothing and household furnishings. Particular emphasis will be placed on fabrics of periods and countries which have most strongly influenced textiles in recent times. These sources of influence include ancient Egypt, Greece and Rome; and Gothic and Renaissance Italy, Spain, France, and England. Modern fabrics of Europe and America will also be studied. Consideration will be given to the social, economic, technical, aesthetic, and historical background of textiles. This course will include illustrated lectures, discussions and visits to exhibitions and stores. It aims to develop appreciation of textiles and discrimination in their selection.

701. **Special Problems in Home Economics.** Three to fifteen credit hours for one Quarter or more. To be given in units of three or five hours. Autumn, Winter, Spring. One conference or more each week.

Problems in various phases of home economics chosen for individual study. Groups will be organized as follows:

(a) Problems in food preparation. Autumn and Winter Quarters. Miss Hughes.

(b) Problems in nutrition and dietetics. Autumn, Winter, Spring. Miss McKay.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

(c) Problems in textiles. Autumn and Spring Quarters. Miss Petzel, Miss Turnbull.
(d) Problems in clothing. Autumn Quarter. Miss Ryan.
(e) Problems in home furnishing. Winter Quarter. Miss Heiner.
(f) Problems in household equipment. Winter and Spring Quarters. Miss Davis.
(g) Problems in home management. Autumn, Winter, Spring.
(h) Problems in institution management, equipment, and food buying. Spring Quarter. Mrs. Kennedy.
(i) Problems in teaching home economics. Winter and Spring Quarters. Mrs. Pressey.
(j) Problems in child development. Autumn and Spring Quarters. Miss Morgan.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

*802. Seminar in Home Economics Teaching. Three to five credit hours. Home Economics 644 must be included in the general prerequisites or taken concurrently. Consent of the instructor must be obtained. Mrs. Pressey.

A study of content, methods, and administration of home economics teaching.

803. Seminar in Foods and Nutrition. Three credit hours. Autumn Quarter. General prerequisites must include the consent of instructor. Miss McKay and others.

Conferences and reports on topics in foods and nutrition.

950. Research in Home Economics. Autumn, Winter, and Spring Quarters. Mrs. Pressey, Miss McKay, Miss Lehman, Miss Morgan, Mrs. Kennedy, Miss Davis, Miss Hughes, Miss Petzel.

Investigational work bearing upon the problems of living, either in the home, the institution or under commercial conditions.

Given in the Summer of 1943.

HORTICULTURE AND FORESTRY

Office, 118 Horticulture and Forestry Building

PROFESSORS GOURLEY, PADDOCK (EMERITUS), BROWN, HOWLETT, AND LAURIE, ASSOCIATE PROFESSOR CHADWICK, ASSISTANT PROFESSORS CHILDERS, DILLER, AND KIPLINGER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include acceptable courses in pomology, vegetable gardening, floriculture and forestry.

*601. Horticultural Plant Breeding. Three credit hours. Winter Quarter. Three recitations each week. Given in alternate years. Mr. Laurie, Mr. Brown.

A study of the methods of breeding of horticultural crops: the modification and improvement of plants under cultivation, together with a discussion of the theories of heredity.

602. Experimental Horticulture. Three credit hours. Autumn Quarter. Two lectures and five hours laboratory each week. Botany 605 must be included in the general prerequisites or taken concurrently. The course is designed for those specializing in pomology, vegetable gardening, floriculture, and ornamental horticulture although it is open to students of other departments. Mr. Howlett.

This course involves primarily the effect of environmental factors upon the growth, flowering, and fruiting of horticultural plants. Emphasis is placed upon the examination of the plants themselves. Particular attention is given to the relation between the environment and practical problems in the greenhouse, field, or orchard. Among the subjects considered are: soilless culture; nitrogen, phosphorus, potassium, calcium and magnesium deficiencies; water deficiency; carbohydrate deficiency and the nitrogen-carbohydrate relationship. Some attention is given to the micro-nutrients as well as to the effect of growth substances upon flowering and fruiting.

* Not given in 1943-1944.

603. Experimental Horticulture. Three credit hours. Winter Quarter. Two lectures and four hours laboratory period each week of which two hours have the time scheduled. Botany 605 must be included in the general prerequisites or taken concurrently. Mr. Childers.

The course involves a study of photosynthesis, respiration, transpiration, translocation, and other physiological processes as related to the practical problems in pruning, propagation, spraying, fertilization, cultivation, harvesting, and storage of horticultural crops. Methods and equipment used in studying the processes, a critical analysis of outstanding horticultural contributions, and preparation of subject matter for publication, will be considered. The course is designed especially for students majoring in floriculture, pomology, and vegetable crops, but is open to students in other departments.

***605. The Literature of Horticulture.** Three credit hours. Winter Quarter. Two lectures and one conference each week. Given in alternate years. Mr. Gourley.

A study of the literature of horticulture.

***608. The Handling, Packing, and Storage of Fruit.** Three credit hours. Autumn Quarter. One recitation and two two-hour laboratory periods each week. Given in alternate years. Not open for graduate credit for students majoring in horticulture. Mr. Childers.

Operations and equipment used in harvesting, handling, and storing fruits are studied. Emphasis is placed on time of picking, packing receptacles, packages, and the packing operation of tree and small fruits. The different types of storages and their construction and operation is also made a main feature of the course. Particular emphasis is given to the physiological principles underlying the common practices in the handling and storage of fruits.

621. Systematic Study of Vegetables. Three credit hours. Autumn Quarter. One recitation and two two-hour laboratory periods each week. Given in alternate years. Mr. Brown.

A systematic study of the botany and origin of the principal vegetable forms and varieties including their description, identification, and special table and storage qualities; adaptation of soils, and resistance to disease.

622. Advanced Vegetable Gardening. Five credit hours. Spring Quarter. Four recitations and one two-hour laboratory period each week. Mr. Brown.

A continuation of Horticulture 522.

Devoted to the study of the history, anatomy, physiology, and culture of the principal vegetable crops including propagation, choice of varieties, soil adaptation, soil preparation, planting, fertilizing, cultivation, pest control, harvesting, storage methods, marketing and cost of production, and income.

***628. The Marketing of Fruits and Vegetables.** Five credit hours. Spring Quarter. Five lecture periods each week. Alternate with Horticulture 651. Mr. Hauck.

The principles involved in marketing fruits and vegetables will be considered. Attention will be given to various phases of preparation for market, distribution, transportation, terminal facilities, auctions, inspection, market news, etc. Emphasis will be placed upon the market outlets and methods which are most suited to Ohio producers. One or two inspection trips of two or three days each will be made.

649. Advanced Plant Propagation. Five credit hours. Winter Quarter. Four recitations and one three-hour laboratory period each week. General prerequisite must include courses in plant propagation and ornamental plants and Botany 605. Mr. Chadwick.

This course is devoted to an intensive and detailed physiological, anatomical, and practical study of the principles and practices of propagation.

***650. Principles and Practices of Nursery Management.** Three credit hours. Spring Quarter. Two recitations and one three-hour laboratory period each week. General prerequisites must include Horticulture 649. Given in alternate years. Mr. Chadwick.

This course is designed to acquaint the student with the fundamentals and practices involved in the management of a modern nursery. The status of the industry, its development in general, and the growing, merchandising and marketing of nursery products in all its phases are considered. Trips to some of the nurseries in the state will be required.

* Not given in 1943-1944.

651. Marketing of Greenhouse and Nursery Products. Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include Business Organization 700. Alternate with Horticulture 628. Mr. Laurie.

The application of marketing techniques to the sale of cut flowers, pot plants and nursery stock will be considered. Attention will be given to the preparation of crops for market, to grading, packaging, shipping and selling direct and through commission houses. Emphasis will be placed on the study of markets and the elimination of periodic gluts. Several inspection trips will be made.

652. Structure of Vegetables and Ornamental Plants. Three credit hours. Autumn Quarter. One recitation and two two-hour laboratory periods each week. Mr. Gourley.

A study of the structure of vegetables and ornamental plants as they relate to the economic production of these crops. The course is designed for advanced students who desire to make a critical study of horticultural plant material.

653. Structure of Economic Fruits. Three credit hours. Winter Quarter. One recitation and two two-hour laboratory periods each week. Mr. Gourley.

A study of the structure and vascular arrangement of horticultural fruits. The viewpoint and emphasis of this course are designed to familiarize students with the structures that play a part in the development of various types of fruits and the relation of these structures in cultural development, spraying, storage, and culinary use.

683. Arboriculture. Three credit hours. Autumn Quarter. Two recitations and one three-hour laboratory period each week. Mr. Chadwick.

A study of the care of ornamental trees and shrubs. Fertilization, spraying, pruning, and tree surgery. A suitable course for those interested in city forestry, park maintenance, and cemetery development.

701. Minor Investigations. Three to fifteen credit hours, taken in units of three or five hours each Quarter for one or more Quarters. Autumn, Winter, Spring. All instructors.

This course is for students who desire to work out special problems in the fields of pomology, vegetable gardening, floriculture or forestry. Students will elect work in their desired subjects after a conference with the instructor in charge.

Given in the Summer of 1943.

704. Horticultural Seminar. One credit hour. Autumn and Winter Quarters. Required of all graduate students majoring in horticulture. All instructors.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Horticulture and Forestry. Autumn, Winter, and Spring Quarters. Graduate students may do investigational work in some phase of the following subjects: pomology, vegetable gardening, plant breeding, floriculture, and forestry. Mr. Gourley, Mr. Brown, Mr. Laurie, Mr. Chadwick, Mr. Childers, Mr. Howlett.

Given in the Summer of 1943.

INDUSTRIAL ARTS EDUCATION

(See Education)

INDUSTRIAL ENGINEERING

Office, 125 Industrial Engineering Building

PROFESSORS YOUNGER, AND KNIGHT (EMERITUS), ASSOCIATE PROFESSORS LEHOCZKY, RICKLY, AND STITT, ASSISTANT PROFESSORS SCHNEIDER AND POOLE, MR. COOPER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

The following courses do not carry graduate credit for students who received the degree Bachelor of Industrial Engineering from The Ohio State University: 601, 602, 603, 604, 661, 701, 702, 706, 751, 752, 761, 762, and 771.

601. Management of Men in Engineering Industries. Four credit hours. One Quarter. Autumn, Winter, Spring. Four recitations each week. General prerequisites must include an acceptable course in elementary machine work or practical experience. Mr. Younger.

The development of engineering organizations and a study of existing organizations. The management of men in engineering organizations.

Not open to students who have credit for Industrial Engineering 712.

602. The Laws of Engineering Management. Three credit hours. One Quarter. Autumn and Spring. Three recitations each week. General prerequisites must include an acceptable course in elementary machine work or practical experience. Mr. Lehoczky.

A consideration from an engineering standpoint of the fundamental laws of engineering management.

603. Time and Motion Study. Three credit hours. One Quarter. Winter and Spring. Three recitations each week. General prerequisites must include Industrial Engineering 661. Mr. Lehoczky.

Principles, aims and application of time and motion study; job analysis, standardization, formula construction, job and wage evaluation.

604. Time and Motion Study Laboratory. Four credit hours. One Quarter. Spring and Autumn. Eight hours of laboratory each week. General prequisites must include Industrial Engineering 603. Mr. Lehoczky, Mr. Poole.

Laboratory application of subject matter covered in Industrial Engineering 603. Simple and complex cycles, motion analysis, micromotion studies, loop analysis, simo-charts, assembly, machine shop and foundry applications. Standards reports including formula reports.

Not open to students who have credit for Industrial Engineering 653.

610. Special Problems. Two to five credit hours. Autumn, Winter, and Spring Quarters. Conference and laboratory. Permission of the instructor must be obtained. All instructors.

The course is designed to permit students in Industrial Engineering or Welding Engineering to carry special work in some phase of Industrial Engineering or Welding Engineering not otherwise covered in courses. The student may do advanced work in time or motion study, foundry work or sand testing, tool design, pattern design, heat treating, machine shop practice, and welding investigation or design.

641. Theory of Welding. Three credit hours. Winter Quarter. Two lectures or recitations and one three-hour labortory period each week. General prerequisites must include a course in forging, shop-heat-treating, and welding and Metallurgy 606. Mr. Stitt.

Fundamental methods and principles of welding; selection of method and type of welding, with due emphasis on economic factors. Welding symbols; metallurgical science pertaining to welding. Laboratory demonstrations.

646. Welding Science and Its Applications. Three credit hours. One Quarter. Autumn, Winter, Spring. Three lectures or recitations each week. General prerequisites must include Mechanics 602. Mr. Stitt.

A basic study of welding and its applications.

661. Production Control Charts. Three credit hours. One Quarter. Autumn, Winter, Spring. Two recitations and one two-hour laboratory period each week. Mr. Lehoczky.

The application of charts and graphs to production problems, organization, management, operation, labor and cost control. Laboratory exercises designed to supplement the theory.

702. Work Routing. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include Industrial Engineering 604. Mr. Younger.

The engineering problems involved in the proper sequence in manufacturing operations. Types of plants to secure the best arrangements of equipment and processing. Handling and supervising the product at and between machines.

706. Methods of Waste Elimination. Three credit hours. Spring Quarter. Three lectures and recitations each week. Mr. Younger.

A study of industrial standards, their control and application. Simplification, inspection, waste elimination, and allied subjects.

712. Management of Men in Engineering Industry. Three credit hours. One Quarter. Autumn, Winter, Spring. Three lectures each week. Mr. Younger.

The developing of engineering organizations. Jobbing and production shops. The coordination and organization of engineering functions. Work-analysis and routing. The handling of men in engineering organizations.

Not open to students who have credit for Industrial Engineering 601.

741. Welding Engineering and Applications. Three credit hours. Autumn Quarter. Three lectures or recitations each week. General prerequisites must include Industrial Engineering 641 and Mechanics 605. Mechanics 702 must be taken concurrently. Mr. Stitt.

Continuation of Industrial Engineering 641; welding specifications, inspection and applications. Effect on manufacturing processes and construction.

742. Welding Design. Three credit hours. Winter Quarter. Two lectures or recitations and one three-hour laboratory period each week. General prerequisites must include Industrial Engineering 741. Civil Engineering 717 and Mechanical Engineering 727 must be taken concurrently. Mr. Stitt.

Welding design in the mechanical and structural fields; economic comparisons of welding designs and other methods of manufacture. Laboratory practice in computations and welding drawings.

743. Advanced Welding Design. Five credit hours. Spring Quarter. Three lectures or recitations and two three-hour laboratory periods each week. General prerequisites must include Industrial Engineering 742 and Mechanical Engineering 728. Mechanical Engineering 743 must be taken concurrently. Mr. Stitt.

Continuation of Industrial Engineering 742, with more complicated designs.

751. Tool Engineering. Three credit hours. Autumn Quarter. One recitation and six hours of drawing-room practice each week. General prerequisites must include a course in advanced machine work. Mr. Rickly.

A course in the design of tools, jigs, and fixtures. Attention given to the forms, life and efficiencies of cutting tools. The simple elements of fixture design, such as different forms, locating points, clamping devices, and standardized parts, with drawing-room practice leading up to design of the more complicated fixtures.

752. Work-routing Laboratory. Three credit hours. Winter Quarter. One recitation and two three-hour laboratory periods each week. General prerequisites must include a course in advanced machine work, Industrial Engineering 604 and 702. Industrial Engineering 702 may be taken concurrently. Mr. Younger.

Practice in the work of selecting and placing machine tools and laying out departments in their proper sequence for manufacturing specific products to best economic advantage.

761. Elementary Production Control. Three credit hours. One Quarter. Autumn and Winter. Three lectures and recitations each week. General prerequisites must include a course in calculus, Accounting 624, and Industrial Engineering 641 or 603. Mr. Lehoczky.

Quantitative analysis from the standpoint of cost control of machines, equipment, and labor

762. Advanced Production Control. Three credit hours. One Quarter. Winter and Spring. Three lectures and recitations each week. General prerequisites must include Industrial Engineering 761. Mr. Lehoczky.

The application of quantitative methods of control in industry in the fields of inverse relationships, least cost combinations, purchasing quantities, seasonal production and related problems.

763. Production Control Research. Three credit hours. One Quarter. Autumn and Spring. Conference, laboratory, and field work. Consent of the instructor must be obtained. Mr. Lehoczky.

The student has a choice of one of two programs. He may do research in advanced phase of material covered in Industrial Engineering 761 and 762, or he may apply the principles taught in such courses as 603, 661, 752, 761, and 762 to the problems of a manufacturing plant. The latter program involves from 60 to 100 hours in a local plant.

771. Safety Engineering. Three credit hours. One Quarter. Spring and Autumn. Three lectures each week. General prerequisites must include a course in elementary machine work and six hours additional credits in other laboratory courses involving mechanical equipment. Mr. Lehoczky.

The nature, causes, and costs of industrial accidents and occupational diseases. Methods of accident prevention, physical, supervisory, and education. Ohio laws, regulations, and aids.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Industrial Engineering. Autumn, Winter, and Spring Quarters. Mr. Younger, Mr. Lehoczky.

Research work in the various phases of Industrial Engineering: production control, production economics, time and motion study, shop processes, etc.

ITALIAN

(See Romance Languages and Literature)

JOURNALISM

Office, 203 Journalism Building

PROFESSORS POLLARD, MYERS (EMERITUS), AND LUXON,
ASSISTANT PROFESSOR GETZLOE, MR. HARSHA

Courses of study leading to the Master's degree may be undertaken as a continuation of either the editorial or management curriculum in the School of Journalism. A major in journalism for the Master's degree does not necessarily mean that all forty-five hours required for the degree shall be in journalism. Related courses in the social sciences, advertising, or English may be scheduled in an integrated program worked out by the student and his adviser. Thus, for example, a journalism-advertising, journalism-history, journalism-political science, or journalism-sociology integrated course of study may be arranged, according to the area of interest of the individual student.

Requirements for the Master's degree with a major in journalism include an undergraduate background of a satisfactory number of basic courses in journalism, two journalism seminars preceding the thesis (research) course, and an approved thesis. In addition, each student is required to take either History 812, Introduction to Historical Research, or Political Science 631, Methods of Governmental Research, as a practice course in research, or satisfy his adviser that he is competent to handle a research problem.

Students who plan a minor in journalism in connection with a major in another field must have the written approval of the Director of the School of Journalism.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. News Editing. Three credit hours. Spring Quarter. Two recitations and one two-hour laboratory period each week. General prerequisites must include a course in copyreading. Permission of instructor necessary. Mr. Luxon.

Study of and practice in the evaluation of news, especially that furnished by press associations. Study of contemporary telegraph and cable news in the daily press, with a comparison of the editing and news evaluation of different newspapers, including rewrite.

602. Feature Writing. Three credit hours. One Quarter. Autumn and Spring. Two recitations and one laboratory period each week on the Lantern. Special permission necessary. Mr. Getzloe.

Instruction in and writing of special newspaper and magazine articles, together with investigation as to the market for such matter.

603. Critical Newspaper Writing. Three credit hours. Spring Quarter. General prerequisites must include elementary courses in journalism or permission of the instructor must be obtained. Mr. Getzloe.

Study of the work of the newspaper dramatic, literary, music, and art critic, with practice in the writing of reviews and criticism.

605. Writing Radio News. Three credit hours. One Quarter. Autumn, Winter, Spring. Special permission of the instructor is required. Mr. Luxon.

The study of the problems of preparing and presenting news material for the radio. Emphasis on the gathering, selection, and editing of news material for radio broadcasting. Practice in the processing of press association reports for newscasts and in the adaptation of newspaper editorial contents for broadcast purposes.

614. Law of the Press. Five credit hours. One Quarter. Autumn and Spring. Five recitations each week. General prerequisites must include elementary courses in journalism. Mr. Pollard.

Origin and development of the freedom of the press; history, principles, and provisions of the laws of libel and copyright and of other statutes affecting peculiarly newspapers and other publications.

617. Public Relations. Three credit hours. Spring Quarter. Three class meetings each week. Permission of instructor necessary.

Study of public relations problems, policies, and practices of welfare and professional organizations, educational and other institutions, industry, commerce and government agencies. A study of the manner in which these organizations make their activities known and how they can most effectively use the media of publicity, the press especially. Organizing of publicity projects and campaigns and their effect on public opinion and action.

621. The Editorial Page. Three credit hours. One Quarter. Autumn and Winter. Three recitations each week. Mr. Getzloe.

Study of the purpose, form, style, and spirit of the editorial. Consideration of current events, practice in news interpretation and other editorial writing, and study of editorial pages.

622. The Press and Contemporary Affairs. Three credit hours. Winter Quarter. Three recitations each week.

The place of the newspaper in the social system. Study of its function and nature as an agency affecting public opinion. Discussion and interpretation of current events. The effects of pressure groups and propaganda upon the press.

623. Comparative Journalism. Three credit hours. Spring Quarter. General prerequisites must include a course in the history of journalism in the United States and elementary courses in political science. Mr. Luxon.

Consideration of the press of other nations, particularly that of the democratic as against the dictator countries, and by comparison and contrast with that of the United States. A study of various aspects of government control and censorship in other nations in terms of current developments.

625. Journalism Practice. Two to five credit hours. All Quarters. A laboratory course in which work is done off the campus.

Credit in this course is given to students who complete, under prearranged supervision of the School of Journalism, not less than eight weeks as full-time paid staff members of a newspaper or newspapers approved by the School.

626. The Newspaper Business Office. Three credit hours. Autumn Quarter. Three recitations each week. Mr. Pollard.

Consideration of the tasks and problems of the newspaper business manager, such as location, valuation, cost-finding, and advertising from the publisher's standpoint.

628. Newspaper Circulation and Promotion. Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include Journalism 626. Mr. Pollard.

Factors affecting newspaper circulation. Types of newspaper circulation, and their evaluation. Circulation methods and policies in use on various types of newspapers, together with promotional, merchandising, and service functions of the newspaper.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

802-803-804. Seminar in Journalism. Three to five credit hours. Autumn, Winter, and Spring Quarters. Mr. Pollard, Mr. Luxon.

Research in various fields in journalism. Integrated reading and research in the fields of (1) history of American (or Ohio) journalism, (2) the press and public opinion, (3) the press and political processes, (4) special problems in the law of the press, (5) newspaper management problems.

950. Research in Journalism. Autumn, Winter, and Spring Quarters. Mr. Pollard, Mr. Luxon.

This course is to be used only for the master's thesis.

LATIN LANGUAGE AND LITERATURE

(See Classical Languages and Literature)

LAW

Office, 113 Page Hall

PROFESSORS MARTIN, MATHEWS, LATTIN, HUNTER, ROSE, AND STRONG, ASSISTANT PROFESSOR STANGER

Constitutional Law. Eight credit hours. Four hours, Autumn Quarter; four hours, Winter Quarter. Mr. Strong.

A study of American constitutional law as developed through an examination of the jurisdiction, powers, techniques, and functions of the Supreme Court of the United States. The greater part of the course is devoted to the functions of the Court in umpiring federal-state and state-state relationships and in balancing governmental and private interests. Consideration of these functions involves the study of the basic constitutional doctrines of due process, police power, full faith and credit, obligation of contract, privileges and immunities, equal protection, intergovernmental immunities, commerce among the states, and separation of powers. Although emphasis is thus upon federal constitutional law, similarities in constitutional doctrine together with occasional reference to doctrines unique to the States, serve to provide as well a background training in state constitutional law.

Material to be announced.

Given in the Summer of 1943.

Contracts. Nine credit hours. Three credit hours each Quarter. Autumn, Winter, Spring. Mr. Vanneman.

Offer and acceptance, consideration, third party beneficiaries, assignments, joint rights and duties, statute of frauds, performance of contracts, conditions precedent and subsequent, impossibility, illegal contracts, and discharge.

Corbin, Cases on Contracts.

Given in the Summer of 1943.

Jurisprudence. Three credit hours. Winter Quarter. Mr. Rose.

A study of judicial reasoning based on a survey of prevailing legal philosophies. Selected materials and cases.

Legal Ethics. Two credit hours. Spring Quarter.

The nature of a profession; ethical duties of lawyers to society, to courts, to clients, to litigants; ethics of employment; pecuniary limitations, advertising, solicitation, fees; lawyers' oath.

Casebook to be announced.

Legal Method and Personal Property. Three credit hours. Spring Quarter. Mr. Rose.

Wherein cases on Personal Property are used both to present the substantive law of that subject (possession, finders, lien, pledge and acquisition of ownership) and to illustrate various philosophies of law, the use of judicial logic and the doctrine of precedent.

Bigelow's Cases on Personal Property, Second Edition.

Mortgages. Three credit hours. Spring Quarter.

Nature and elements of a mortgage, legal and equitable, real and personal; incidents of the mortgage relation, right to possession and remedies of the mortgagee; discharge by payment, tender and merger; subrogation; assignments; redemption; foreclosure; extent of the lien, priorities between liens and competing claimants; and conveyance of the equity of redemption.

Casebook to be announced.

Municipal Corporations. (Reading Course). Two credit hours. Spring Quarter.

A reading course, based upon Ohio and other materials, designed to give the student a working knowledge of the nature of municipal corporations, the evolution of municipal home rule, legal problems arising from home rule in Ohio, in police and taxing powers of municipal corporations, and their liability, common law and statutory, in contract and tort.

In this course students are expected to work out the subject matter of the course through suggested readings in cases, texts, and articles. Students have the privilege of conferring with the instructor in charge of the course once a week at an hour designated for that purpose.

Negotiable Instruments. Four credit hours. Winter Quarter. Mr. Hunter.

Types of Commercial or Negotiable paper; transfer; purchase and payment in due course, discount and security.

Steffen, Cases on Commercial and Investment Paper.

Private Corporations. Six credit hours. Autumn Quarter. Mr. Lattin.

A consideration of the business corporation as a device for the furtherance of trade and of manufacturing, with emphasis upon the law of corporate finance and upon problems of present-day importance. More specifically, the course is a study of the formation of corporations; the separate corporate capacity or entity privilege and its limitations; the criminal and tort liability of corporations; directors and management; rights and liabilities on contracts as effected by the statement of corporate purposes in the articles; rights and powers of shareholders; issue of shares and subscriptions, underwriting, marketing of securities; stock structure and classes of shares; capital requirements and declaration of dividends; redemption of shares; reduction of legal capital; liabilities of shareholders, directors, and promoters to the corporation and to creditors in connection with the issue of shares; transfer of shares (rights and liabilities of the corporation, transferor and transferee); fundamental changes in the corporate organization; minority rights; and shareholders' actions.

Ballantine and Lattin's Cases and Materials on Corporations.

Real Property. Seven credit hours. Winter Quarter. Mr. Martin.

A study of interests in land and their transfer *inter vivos*. Possessory estates; concurrent ownership; an introduction to nonpossessory estates. Formalities of execution, content, and construction of Conveyances. Estoppel by deed; adverse possession and adverse use; zoning laws; statutory liens. The Recording system; title registration.

Martin, Cases on Real Property.

Sales. Three credit hours. Winter Quarter. Mr. Lattin.

Transfer of title to personal property as a result of contract; rules for determining intent as to relative time of its transfer; different types of sales; documents of title; obligations of seller and buyer as to warranties; delivery and payment, inspection, acceptance; rights of unpaid seller.

Casebook to be announced.

MANUAL ARTS
(See Education)

LINGUISTIC STUDIES

ADVISORY COMMITTEE: PROFESSORS SCHUTZ AND SPERBER, ASSISTANT PROFESSORS ABBOTT AND UTLEY

Graduate instruction in linguistics is offered in Classics, English, German, and Romance Languages. An advisory Committee coordinates the different phases of instruction. Students are encouraged to formulate interdepartmental programs of study and research and to provide a broad and adequate foundation for scholarship. In selecting a topic for a thesis or a dissertation a student should carefully consider the specialized research interests of the instructor with whom he expects to work. The following summary of courses indicates the opportunities for graduate study in this field. A more detailed description of each of these courses will be found under the appropriate departmental announcements.

CLASSICS

Latin and Greek

627. Vulgar Latin. Mr. Abbott.
720. Introduction to Historical Greek and Latin Grammar. Mr. Abbott.
721-*722. Historical Greek and Latin Grammar. Mr. Abbott.

ENGLISH

625. Standards of English Usage. Mr. Estrich.
627. The Language We Speak. Mr. Utley.
701. Minor Problems in English. English Language. Mr. Utley, Mr. Estrich.
*746. Middle and Modern English. Mr. Utley.
*751. Language and Literature of the Anglo-Saxons. Mr. Estrich.

GERMAN

*656. Introduction to the Historical Study of German. Mr. Sperber.
*673. Elementary Middle High German. Mr. Sperber.
*675. Elements of Semantics. Mr. Sperber.
705. Principles of the Historical Study of Language. Mr. Sperber.
801. Advanced Middle High German. Mr. Sperber.
805. Gothic. Mr. Sperber.
810. Old High German. Mr. Sperber.
870. Seminar in German Linguistics. Mr. Sperber.

ROMANCE LANGUAGES

French

628. Modern French Syntax. Mr. Schutz.
*629. History of the French Language. Mr. Schutz.
801-802. Introduction to Old French Linguistics. Mr. Schutz, Mr. Moore.
*803-*804. Old Provencal. Mr. Schutz.

Spanish

617. Modern Spanish Syntax. Mr. Anibal.
805-806. Old Spanish. Mr. Hendrix.

* Not given in 1943-1944.

MATHEMATICS

Office, 306 University Hall

PROFESSORS KUHN, RASOR, MORRIS, BLUMBERG, RADO, BAMFORTH, AND LaPAZ, ASSISTANT PROFESSORS BAREIS, BEATTY, CARIS, RICKARD, AND WYLIE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These general prerequisites include an acceptable course in calculus.

601. Advanced Calculus. Five credit hours. Autumn Quarter.

Selected topics from Advanced Calculus.

Given in the Summer of 1943.

607. Introduction to the Theory of Functions of a Complex Variable. Five credit hours. Winter Quarter. General prerequisites must include Mathematics 601.

The algebra of complex numbers with their corresponding geometric representation; conformal representation; theory of power series, definition and properties of analytic functions; introduction to the theory of functions as developed by Cauchy, Riemann, and Weierstrass with applications in physics and engineering.

608. Advanced Calculus. Three credit hours. Autumn Quarter. Mr. Wylie.

Selected topics in advanced calculus, with particular emphasis on engineering applications.

Not open to students who have credit for Mathematics 501.

Given in the Summer of 1943.

609. Differential Equations. Three credit hours. One Quarter. Autumn and Winter. General prerequisites must include Mathematics 608 or its equivalent. Mr. Wylie.

Selected topics in differential equations with engineering applications.

Not open to students who have credit for Mathematics 502.

610. Vector Analysis. Three credit hours. One Quarter. Winter and Spring. General prerequisites must include Mathematics 608 or its equivalent. Mr. Wylie.

Vector and scalar algebra differentiation and differential operators with applications to electricity.

Not open to students who have credit for Mathematics 503.

611. Differential Equations. Five credit hours. Winter Quarter.

Linear equations with constant coefficients; equations of first, second, and higher orders; numerical approximations; solutions in series; existence theorems of Picard, Cauchy, and Frobenius; simple partial differential equations; applications.

Given in the Summer of 1943.

***617. Introduction to Modern Mathematics.** Five credit hours. Autumn Quarter. Mr. Blumberg.

The content will be selected from the following fields: graphical and numerical methods, projective geometry, theory of numbers, the mathematical continuum, mathematical foundations, point sets, groups, probability, and relativity. In general, topics of interest to high school teachers will be discussed.

***621. Advanced Euclidean Geometry.** Five credit hours. Winter Quarter.

Geometric constructions; points, lines and circles associated with a triangle; harmonic ranges and pencils; harmonic properties of the circle; radical axis; pole and polar with respect to a circle; inversion; symmedian points; Brocard points. This is chiefly a problem course in the field of plane geometry, and is of special value to teachers of this subject.

***623. Projective Geometry.** Five credit hours. Spring Quarter. Miss Bareis.

Plucker line coordinates, duality, infinite elements, projection, double ratio, projective coordinates in one and two dimensions, projective transformations, collineations and involutions in one dimension, projective properties of conics.

* Not given in 1943-1944.

***625. Solid Analytical Geometry.** Five credit hours. Autumn Quarter. Given in alternate years. Miss Bareis.

Systems of co-ordinates; planes and lines; types of surfaces; quadric surfaces; duality.

†641. Elementary Theory of Equations. Five credit hours. Autumn Quarter.

Construction with ruler and compasses, numerical equations, determinants, symmetric functions. Text: Dickson's First Course in the Theory of Equations.
Given in the Summer of 1943.

651. Fundamental Ideas in Algebra and Geometry. Three credit hours. Autumn Quarter.

The aims of this course are to provide a suitable mathematical background for (a) teachers and prospective teachers of secondary school mathematics and (b) students who desire a better appreciation of modern science. The content will include a discussion of rational numbers, real numbers, complex numbers, hyper-complex numbers, and finite fields; finite groups, theory of numbers; number scales; empirical and historical development of algebraic and geometric facts; undefined elements; types of assumptions used in algebra and geometry; Euclidean geometry; and certain non-Euclidean geometries.

652. Fundamental Ideas in Algebra and Geometry. Three credit hours. Winter Quarter. General prerequisites must include Mathematics 651 or the permission of the instructor must be obtained.

A continuation of Mathematics 651.

653. Fundamental Ideas in Algebra and Geometry. Three credit hours. Spring Quarter. General prerequisites must include Mathematics 652 or the permission of the instructor must be obtained.

A continuation of Mathematics 652.
Given in the Summer of 1943.

661. Vector Analysis. Five credit hours. Spring Quarter. General prerequisites must include Mathematics 601 and a course in physics, or the equivalent.

Vector and scalar algebra and geometry, differentiation and differential operators, applications to electrical theory and to mechanics, dynamics, and hydro-dynamics.

***671. Introduction to the Theory of Relativity.** Five credit hours. Spring Quarter. General prerequisites must include Mathematics 661. Mr. Blumberg.

This course will be prefaced by a brief review of those parts of the classical theories of dynamics and physics which are necessary to an understanding of the special theory of relativity its applications, and the elementary aspects of the general theory of relativity.

***691. Probability.** Five credit hours. Autumn Quarter. Given in alternate years. General prerequisites must include a course in calculus. Mr. Morris.

The first half of the course will be devoted to the development of the theory of probability from the standpoint of permutations, combinations, choice and chance the second half to a formal development of the subject as given by Coolidge in "Introduction to Probability."

***692. Finite Differences.** Five credit hours. Winter Quarter. Given in alternate years. General prerequisites must include Mathematics 691. Mr. Morris.

An introduction to finite differences; development of the more important methods of interpolation and summation.

***696. Statistics.** Five credit hours. Spring Quarter. Given in alternate years. General prerequisites must include Mathematics 692. Mr. Morris.

Derivation of statistical formulas by use of the theory of probability; least squares and their application to curve fitting; frequency distribution curves.

700. Minor Problems. Three to five credit hours. Autumn, Winter, and Spring Quarters.

This course consists of conferences, assigned readings, and reports for minor investigations.
Given in the Summer of 1943.

* Not given in 1943-1944.
† Not given during the academic year, 1943-1944.

721. Mathematical Methods in Science, I. Five credit hours. Autumn Quarter. General prerequisites must include either Mathematics 601, 611, or Mathematics 608, 609, 610, or permission of the instructor. Mr. Albert.

Application of Fourier Series, Bessel's functions, Fourier integrals, Bessel-Fourier integrals, spherical harmonics and classical and direct methods of the calculus of variation to problems in science.

722. Mathematical Methods in Science, II. Five credit hours. Winter Quarter. General prerequisites must include Mathematics 721. Mr. Bamforth.

A continuation of Mathematics 721.

723. Mathematical Methods in Science, III. Five credit hours. Spring Quarter. General prerequisites must include either Mathematics 601, 611, or Mathematics 608, 609, 610 or permission of the instructor. Mr. LaPaz.

A continuation of Mathematics 722.

***741-*742-*743. Introduction to Higher Geometry.** Five credit hours. Autumn, Winter, and Spring Quarters. Permission of the instructor must be obtained. Mr. Radó.

Metric, affine, and projective properties of conic sections and of quadric surfaces. Fundamental notions of differential geometry. Geometry on a surface. Non-Euclidean geometries. Groups of transformations.

761-762-763. Introduction to Higher Algebra. Five credit hours. Autumn, Winter, and Spring Quarters. Permission of the instructor must be obtained. Mr. Bamforth, Mr. LaPaz.

Elementary theory of number; congruences; binary forms; continued fractions; groups; fields; matrices; invariants; elementary divisors; Galois fields; algebraic fields; ideals.

NOTE: TEACHING COURSES. For the Teaching Course in this department see the Department of Education, Course 687.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

Students intending to specialize in mathematics should acquire as soon as possible a reading knowledge of French, German, and Italian.

NOTE: Students should consult with instructors before registering for courses open only to graduates.

GRADUATE MATHEMATICS CLUB

The Graduate Mathematics Club fosters interest in the latest advances in Mathematics, its application and its pedagogy. The meetings, which are held fortnightly consist of reports by members of the staff and by graduate students on their own investigations or on recent books or journal articles, and of addresses intended to orient the members of the Club in reference to various mathematical branches of wide scope. As far as possible, the presentation of the papers demands a minimum of technical equipment on the part of the hearers and is on the whole intended to be intelligible to students beginning their graduate work. Since it is the Graduate Mathematics Club which brings into special focus the living, growing character of mathematical science, it is expected that all graduate students of mathematics will cooperate in the work of the Club and attend the meetings regularly.

801-802-803. Theory of Functions of a Complex Variable. Three credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include Mathematics 833 or permission of the instructor must be obtained. Mr. Radó.

Fundamentals. Application to Conformal Mapping.

***804-*805-*806. Point Sets and Real Functions.** Three credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include Mathematics 833 or permission of the instructor must be obtained. Mr. Blumberg.

A development of the ideas from the simplest to those contained in current literature. The principal aim is the comprehension of the principles for asking and answering questions in this field.

* Not given in 1943-1944.

807-808-809. Ordinary and Partial Differential Equations. Three credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include Mathematics 833 or permission of the instructor must be obtained. Mr. Bamforth.

Existence theorems; properties of solutions depending upon initial conditions and parameters; geometrical properties of solutions; dynamical systems; stability of solutions; linear differential equations. Applications to problems in engineering, physics, chemistry.

***810-*811-*812. Calculus of Variations.** Three credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include Mathematics 833 or permission of the instructor must be obtained. Mr. LaPaz.

Formulation of typical problems; classical necessary conditions; the Jacobi condition and the criteria for conjugate points due to Bliss; imbedding theorems and the Weierstrass sufficiency proof; the Hamilton-Jacobi theory; double integral problems; inverse problems and direct methods in the calculus of variations; applications in engineering, physics, and Riemannian geometry.

***813-*814. Mathematical Methods in Theoretical Physics.** Three credit hours. Autumn and Winter Quarters. General prerequisites must include Mathematics 601 or permission of the instructor must be obtained. Mr. Bamforth.

This course aims to discuss from a mathematical point of view topics which are fundamental in the study of modern theoretical physics, such as series development of arbitrary functions, integral equations, calculus of variations, boundary value problems, and potential theory.

***816. Fourier's Series and Spherical Harmonics.** Three credit hours. Spring Quarter. General prerequisites must include Mathematics 831, 832, or permission of the instructor must be obtained. Mr. Bamforth.

Convergence, summability, integration and differentiation of Fourier's Series, expansions of functions in terms of Legendre's Polynomials, and surface spherical harmonics; applications to physics.

***818. Infinite Series and Products.** Three credit hours. Spring Quarter. General prerequisites must include ten Quarter-hours of mathematics beyond calculus. Mr. Blumberg.

This course includes selections from the following topics: theories of irrationals; series of positive terms; convergence tests; general series; double series; transformation of series; infinite products; Fourier, Dirichlet, and power series; special series; divergent series.

***820. Integral Equations.** Three credit hours. Spring Quarter.

†823. Tensor Analysis. Three credit hours. Spring Quarter. Permission of the instructor must be obtained.

Foundations and algorithms of the metric tensor calculus; applications in the theory of relativity; the geometry of paths; tensors of the calculus of variations.

Given in the Summer of 1943.

†825. Partial Differential Equations. Three credit hours. Permission of the instructor must be obtained. Mr. Bamforth.

A study of partial differential equations of the first and second order, with special attention to the various applications to geometry and physics.

Given in the Summer of 1943.

831. Introduction to Analysis I. Five credit hours. Autumn Quarter. Permission of instructor must be obtained. Mr. Blumberg.

The principal aim will be to train the student in handling with some facility various fundamental notions and methods in analysis. The subject matter will be selected from the following topics: the real continuum; introduction to the theory of Point Sets; basal notions in the field of real functions; measure; Riemann, Lebesgue, and other integrals; multiple integrals; Green's and related theorems; implicit functions; series, and in particular, introduction to Fourier series.

Not open to students who have credit for Mathematics 701.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

832. **Introduction to Analysis II.** Five credit hours. Winter Quarter. Permission of instructor must be obtained. Mr. Blumberg.

A continuation of Mathematics 831.

Not open to students who have credit for Mathematics 702.

833. **Introduction to Analysis III.** Five credit hours. Spring Quarter. Permission of instructor must be obtained. Mr. Blumberg.

A continuation of Mathematics 832.

Not open to students who have credit for Mathematics 703.

*841-*842-*843. **Differential Geometry.** Three credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include Mathematics 743 or permission of the instructor must be obtained. Mr. Radó.

Review of fundamental notions. Applications of the general theory to special problems, in particular to problems in the large and to variation problems arising in connection with length, area, volume, curvature.

*861. **Theory of Fields.** Three credit hours. Autumn Quarter. General prerequisites must include Mathematics 763. Mr. Radó.

Steinitz's theory of fields.

*862. **Theory of Matrices.** Three credit hours. Winter Quarter. General prerequisites must include Mathematics 861. Mr. Radó.

Advanced topics in the theory of matrices with particular attention to matrices with integral elements.

*867. **Linear Algebras.** Three credit hours. Winter Quarter. General prerequisites must include Mathematics 862.

A study of linear algebras and their arithmetics, with particular attention to Dickson's theory of hypercomplex integers.

*868. **Theory of Ideals.** Three credit hours.

Ideal theory of commutative and non-commutative rings.

*871-*872. **Finite Groups.** Three credit hours. Winter and Spring Quarters. Permission of the instructor must be obtained.

Fundamentals of the theory of finite groups; the abstract, permutation, and linear groups; the Galois theory of equations; applications.

*874. **Continuous Groups.** Three credit hours. Winter Quarter. Permission of the instructor must be obtained. Mr. Bamforth.

A study of Lie's theory of r-parameter continuous groups with an introduction to some of the recent investigations of Cartan and Weyl.

*891. **Advanced Statistics.** Three credit hours. Spring Quarter. General prerequisites must include Mathematics 696. Mr. Morris.

Small sample theory and its applications to statistical problems.

950. **Research in Mathematics.** Autumn, Winter, and Spring Quarters. Library work and conferences. Permission of the department must be obtained.

Given in the Summer of 1943.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

MECHANICAL ENGINEERING

Office, 247 Robinson Laboratory

PROFESSORS MARQUIS, NORMAN, JUDD (EMERITUS), BROWN, BUCHER, AND STINSON, ASSOCIATE PROFESSORS MOFFAT, BEITLER, AND ROBERTS, ASSISTANT PROFESSORS MARCO AND LINDAHL

Prerequisites for Graduate Work: For major work a student must hold a baccalaureate degree in mechanical engineering or its equivalent and his application must be approved by the department's committee on graduate work. A student desiring to work for a Master's degree in this field must have at least a 2.5 point-hour ratio for all his undergraduate work and a 2.75 point-hour ratio in the mechanical engineering courses, on the basis of the grading system at this University. A student having lower point-hour ratios may be permitted to work toward a Master's degree if the department's committee on graduate work judges that there are extenuating circumstances.

The application of a student desiring to work for the degree Doctor of Philosophy in this field must be approved by the department's committee on graduate work when he has received the Master's degree, or after he has received the approval of the Graduate Council in case part of the work is done elsewhere than in this University.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These general prerequisites include fundamental courses in mathematics, physics, and mechanics.

The following courses do not carry graduate credit for students who received the degree of Bachelor of Mechanical Engineering from The Ohio State University: 607, 608, 609, 611, 615, 625, 627, 664, 665, 710, 727, 728, 742, 744, 779, 780, and 781.

605. Heating and Ventilating. Four credit hours. Spring Quarter. Four recitations each week. General prerequisites must include a course in heat-power engineering. Mr. Lindahl.

A descriptive and analytical study of the apparatus and machinery and of the layouts used in the heating and ventilating of buildings.

607. Heat-Power Engineering. Five credit hours. Autumn Quarter. Five recitations each week. General prerequisites must include a course in engineering drawing and three Quarters of elementary chemistry. Mr. Marquis, Mr. Bucher, Mr. Lindahl.

The beginning of a study of thermodynamics, and of an analytical and descriptive study of steam-generating and steam-using machinery, and of air compression and refrigeration.

608. Heat-Power Engineering. Five credit hours. Winter Quarter. Five recitations each week. General prerequisites must include Mechanical Engineering 607. Mr. Marquis, Mr. Bucher, Mr. Lindahl.

The continuation of Mechanical Engineering 607.

Given in the Summer of 1943.

609. Heat-Power Engineering. Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include Mechanical Engineering 608. Mr. Marquis, Mr. Bucher, Mr. Lindahl.

The continuation of Mechanical Engineering 608.

611. Heat Transmission. Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include Mechanical Engineering 608. Mr. Brown, Mr. Marco.

Study of the laws of heat transmission as applied in the design of buildings, heaters, coolers, condensers, evaporators, and engine cylinders.

612. Machine Design. Four credit hours. One Quarter. Autumn and Winter. Four recitations each week. General prerequisites must include Mechanics 602. Mr. Moffat, Mr. Marco.

A detailed course of study of the principles of mechanics and strength of materials applied to the design and construction of machinery.

Given in the Summer of 1943.

613. **Machine Design.** Five credit hours. One Quarter. Winter and Spring. Three recitations and two three-hour laboratory periods each week. General prerequisites must include Mechanical Engineering 612. Mr. Moffat, Mr. Marco.

Continuation of Mechanical Engineering 612.
Given in the Summer of 1943.

615. **Mechanism.** Five credit hours. Autumn Quarter. Three recitations and two three-hour laboratory periods each week. General prerequisites must include a course in engineering drawing. Mr. Stinson, Mr. Moffat.

A classroom and drawing-board study of mechanisms and kinematics of machines.

617. **Mechanical Engineering Laboratory.** Four credit hours. Autumn Quarter. Two recitations and one four-hour laboratory period each week. General prerequisites must include Mechanics 610 and Metallurgy 651. Mr. Beitler, Mr. Robinson.

Lecture and recitations on pressure and temperature measurements, on steam engines and turbines, and on boilers and combustion. Laboratory work in the calibration of pressure gauges and indicator springs; testing of steam engines, pumps and boilers.

625. **Internal Combustion Engines.** Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include Mechanical Engineering 608 and 615. Mr. Stinson, Mr. Roberts.

A study of internal combustion engines and their auxiliaries.

627. **Materials of Engineering.** Five credit hours. Winter Quarter. Five recitations each week. General prerequisites must include three Quarters of elementary chemistry. Mr. Moffat, Mr. Marco.

A study of the production and properties of the materials used in engineering structures and machinery.

Not open to students who have credit for Mechanical Engineering 427.
Given in the Summer of 1943.

664. **Mechanical Engineering Laboratory.** Three credit hours. Winter Quarter. One five-hour laboratory period each week. General prerequisites must include Mechanical Engineering 607; Mechanics 610, Mechanics 602 and Mechanical Engineering 608 must be taken previously or concurrently. Mr. Bucher, Mr. Roberts, Mr. Marco, Mr. Lindahl, Mr. Robinson.

The calibration of thermometers, pressure gauges, and other instruments; indicator practice; operation of steam engines; tests of oils, lubricants, the materials of construction, and of steam engines.
Given in the Summer of 1943.

665. **Mechanical Engineering Laboratory.** Three credit hours. Spring Quarter. One five-hour laboratory period each week. General prerequisites must include Mechanical Engineering 608 and 664. Mechanical Engineering 609 and Mechanics 607 must be taken previously or concurrently. Mr. Bucher, Mr. Marco, Mr. Moffat, Mr. Lindahl, Mr. Robinson.

Valve setting, moisture determination in steam, gas calorimetry, measurements of the flow of water by means of orifices, nozzles, weirs, and venturimeters, and tests of steam engines.

673. **Mechanical Engineering Laboratory.** Four credit hours. Autumn Quarter. Two recitations and one four-hour laboratory period. General prerequisites must include Mechanics 610. Mr. Brown, Mr. Beitler, Mr. Marco, Mr. Lindahl.

Study of the flow of liquids and gases. Lectures and recitations on applied hydraulics, steam engines, and boilers. Practice in the calibration of weirs, orifices, and venturimeters. The operation and testing of steam engines and of reciprocating and centrifugal pumps.

674. **Mechanical Engineering Laboratory.** Four credit hours. Winter Quarter. Two recitations and one four-hour laboratory period each week. General prerequisites must include Mechanical Engineering 673. Mr. Beitler, Mr. Lindahl, Mr. Robinson.

The continuation of Mechanical Engineering 673.
Given in the Summer of 1943.

703. Aeronautical and Automotive Engines. Three credit hours. Autumn Quarter. Three recitations each week. General prerequisites must include Mechanics 602 and 607, and Mechanical Engineering 625 or 674. Mr. Stinson.

A descriptive and analytical study of automotive and aeronautical engines and their auxiliaries.

704-705. Automotive Engineering. Three credit hours. Winter and Spring Quarters. Three recitations each week. General prerequisites must include Mechanical Engineering 625 or 703. Mr. Stinson.

An advanced study of automotive engines, chassis and auxiliaries.

710. Heating, Ventilating, and Air Conditioning. Four credit hours. Autumn Quarter. Four recitations each week. General prerequisites must include Mechanical Engineering 611. Mr. Brown, Mr. Marco, Mr. Lindahl.

Study of the heating and cooling requirements of buildings and of the mechanical equipment used for heating and ventilating. Problems in the design of heating and ventilating systems.

Not open to students who have credit for Mechanical Engineering 605.

725. Diesel Engines. Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include Mechanical Engineering 625 or 704. Mr. Stinson.

An advanced study of Diesel-engine design, operation and economics.

727. Machine Design. Five credit hours. Autumn Quarter. Five recitations each week. General prerequisites must include Mechanics 602 and 605 or 607. Mechanical Engineering 609 and 615 or a course in engineering drawing. Mr. Norman, Mr. Marco.

A detailed course of study based upon mechanics and the materials of construction applied to the design and construction of machinery.

728. Machine Design. Five credit hours. Winter Quarter. Three recitations and two three-hour laboratory periods each week. General prerequisites must include Mechanical Engineering 727. Mr. Norman, Mr. Marco.

The continuation of Mechanical Engineering 727.
Given in the Summer of 1943.

742. Hydraulic Machinery. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include Mechanics 610 and Mechanical Engineering 609, 617, or 673. Mr. Beitler, Mr. Lindahl.

The application of hydraulic principles to hydraulic machinery.
Given in the Summer of 1943.

743. Machine Design. Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include Mechanical Engineering 728. Mr. Norman, Mr. Marco.

The continuation of Mechanical Engineering 728.

744. Machine Design. Five credit hours. Spring Quarter. Three recitations and two three-hour laboratory periods each week. General prerequisites must include Mechanical Engineering 728. Mr. Norman, Mr. Marco.

The continuation of Mechanical Engineering 728.

757. Aeronautical Engineering. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include Mechanics 602, 607, and 610. Mr. Stinson.

A descriptive and analytical study of the various forms of aircraft and the elementary principles of aerodynamics.

779. Mechanical Engineering Laboratory. Three credit hours. Autumn Quarter. One five-hour laboratory period each week. General prerequisites must include Mechanical Engineering 609, 625, and 665. Mr. Brown, Mr. Bucher, Mr. Marco, Mr. Roberts.

Tests of steam engines; steam boilers; gas, oil and automotive engines; air compressors; centrifugal, rotary and power pumps; impulse and turbine water wheels; fans and blowers; steam turbines.

780. Mechanical Engineering Laboratory. Three credit hours. Winter Quarter. One five-hour laboratory period each week. General prerequisites must include Mechanical Engineering 779. Mr. Bucher, Mr. Roberts, Mr. Stinson.

The work undertaken will be elected from the following:

(a) General Mechanical Engineering Laboratory. Tests of mechanical equipment such as air compressors, steam turbines, fans, oil, gas, and automotive engines, pumps, and hydraulic turbines, so selected as to be fundamental to all branches of mechanical engineering.

(b) Automotive Engineering Laboratory. Tests of apparatus of special interest in automotive engineering such as internal combustion engines, and complete vehicles, in the laboratory and on the road. To be taken only by students who elect Mechanical Engineering 704.

Given in the Summer of 1943.

781. Mechanical Engineering Laboratory. Three credit hours. Spring Quarter. One five-hour laboratory period each week. General prerequisites must include Mechanical Engineering 780. Mr. Brown, Mr. Bucher, Mr. Stinson, Mr. Roberts, Mr. Lindahl.

The work undertaken will be elected from the following:

(a) General Mechanical Engineering Laboratory. A continuation of Mechanical Engineering 780-a.

(b) Automotive Engineering Laboratory. A continuation of Mechanical Engineering 780-b. To be taken only by students who elect Mechanical Engineering 705.

(c) Hydraulic Power Laboratory. A laboratory study of the dynamics of jets, the flow and measurement of water and the testing of impulse and reaction turbines. To be taken only by students who have credit for Mechanical Engineering 742.

799. Special Problems in Advanced Mechanical Engineering. Two to ten credit hours. Autumn, Winter, and Spring Quarters. All instructors.

This course is intended to give the advanced student opportunity to pursue special studies not offered in the fixed curriculum. Work undertaken will be elected from aeronautical engineering, heating, ventilating and air conditioning, hydraulic power, air compression, refrigeration, steam turbines, internal combustion engines, and other special problems in Advanced Mechanical Engineering. A student may repeat this course until he has obtained a maximum of 24 credit hours. He may accumulate not more than ten credit hours in any one of the above subdivisions.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION." page 45.

These prerequisites include a collegiate course in mechanics, strength of materials, machine design, steam or gas engines and knowledge of the fundamentals of hydraulics.

804. Advanced Mechanical Engineering. Two to eight credit hours. The course is offered in one or more Quarters. Autumn, Winter, Spring. The work includes conferences, library, drawing board, and laboratory work.

a. Internal Combustion Engines. Mr. Stinson, Mr. Roberts.
b. Steam Power Plants. Mr. Marquis, Mr. Bucher.
c. Machine Design. Mr. Norman, Mr. Marco.
d. Heating and Ventilating. Mr. Brown.
e. Hydraulics. Mr. Beitler.

Given in the Summer of 1943.

950. Research in Mechanical Engineering. Research work in any of the following fields, under the supervision of the following instructors: automotive engineering and internal combustion engines, Mr. Stinson, Mr. Roberts; heating, ventilating, air conditioning, and refrigerating, Mr. Brown; applied hydraulics, Mr. Beitler; machine design and mechanical vibration, Mr. Norman; materials of engineering, Mr. Moffat; steam engineering and fuel testing, Mr. Marquis, Mr. Bucher.

Given in the Summer of 1943.

MECHANICS

Office, 205 Industrial Engineering Building

PROFESSORS OTT, BOYD (EMERITUS), AND FOLK, ASSOCIATE PROFESSORS POWELL AND CLARK, ASSISTANT PROFESSOR TUCKER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include acceptable courses in differential and integral calculus and physics.

601. Statics. Five credit hours. One Quarter. Autumn and Winter. Five recitations each week. All instructors.

Given in the Summer of 1943.

602. Strength of Materials. Five credit hours. One Quarter. Autumn, Winter, Spring. Four recitations and one two-hour laboratory period each week. General prerequisites must include a course in statics. All instructors.

Stresses and deformations: torsion; riveted and welded joints; deflection of beams and columns by double integration; horizontal shear.

Given in the Summer of 1943.

605. Strength of Materials. Two credit hours. One Quarter. Autumn and Spring. Two recitations each week. General prerequisites must include Mechanics 602. All instructors.

Combined stress; resilience in bending and torsion; inclined beams; deflection by area moments; statically indeterminate and tapered beams; lateral buckling of beams.

Not open to students who have credit for Mechanics 615.

607. Dynamics. Three credit hours. One Quarter. Autumn, Winter, Spring. Three recitations each week. General prerequisites must include a course in statics. All instructors.

Dynamics of linear and angular motion from constant forces and forces proportional to displacement; connected bodies; impulse and momentum; combined rotation and translation; work, energy, and power.

Not open to students who have credit for Mechanics 617.

Given in the Summer of 1943.

610. Mechanics of Fluids. Three credit hours. One Quarter. Autumn, Winter, Spring. Three recitations each week. General prerequisites must include a course in statics. All instructors.

Fluid pressure including stability of simple gravity dams; fundamentals of fluid flow including orifices, weirs, nozzles, venturis, and vortices; pressure of deviated flow; flow friction; non-turbulent flow in pipes, and steady turbulent flow in pipes and uniform open channels; effect of viscosity hydraulic models.

Given in the Summer of 1943.

615. Strength of Materials and Elastic Stability. Five credit hours. Winter Quarter. Five recitations each week. General prerequisites must include Mechanics 602. Mr. Folk.

Same content as Mechanics 605 with the addition of: stresses beyond the elastic limit, bending and buckling of thin walled columns and thin plates, collapse of thin walled tubes in torsion, and critical stress as a basis for design.

Not open to students who have credit for Mechanics 605.

617. Dynamics. Five credit hours. Winter Quarter. Five recitations each week. General prerequisites must include Mechanics 602. Mr. Clark.

Same content as Mechanics 607 with the addition of internal stresses in accelerated bodies and structures.

Not open to students who have credit for Mechanics 607.

650. Aircraft Problems. Five credit hours. Spring Quarter. Five recitations each week. General prerequisites must include Mechanics 615 and 617 and Aeronautical Engineering 601. Mr. Ott.

Selected topics from the prerequisite courses will be reviewed and given more extended treatment. The use of calculus methods will be emphasized and differential equations introduced.

702. Advanced Strength of Materials. Three credit hours. Autumn Quarter. Three lectures or recitations each week. General prerequisites must include Mechanics 602. Mr. Folk.

Combined stresses; theories of failure of elastic action; design of thick-walled cylinders; stresses in flat plates by approximate methods and by Grashof's formula; curved beams and hooks; torsion in non-circular sections; unsymmetrical sections.

707. Advanced Dynamics. Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include Mechanics 607. Mr. Ott.

Acceleration, velocity and displacement from variable forces. Vibration, free and forced. Percussion and impact. Dynamic balance. Vibration and whipping of shafts. Gyroscopic motion.

710. Advanced Mechanics of Fluids. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include Mechanics 610. Mr. Powell.

A continuation of subject matter of Mechanics 610, including plotting of streamlines and pathlines; Von Karman's theory of pipe friction; unsteady flow in pipes; non-uniform flow in open channels; and the elements of dimensional analysis and dynamic similarity as applied to model testing.

799. Special Problems in Advanced Mechanics. Two to five credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include Mechanics 602 and 607, and consent of instructor. All instructors.

This course is intended to give the advanced student an opportunity to pursue special studies not offered in fixed curricula, in such topics as mechanics of earth action, photoelastic analysis, stress analysis by various types of models, balancing and other dynamic problems, advanced theoretical mechanics, and the study of hydraulic models. A student may repeat the course until he has a maximum of fifteen credit hours.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Mechanics. Autumn, Winter, and Spring Quarters.

MEDICAL AND SURGICAL RESEARCH

(See Medicine and Surgical Research)

MEDICINE

Office, Kinsman Hall

PROFESSOR DOAN AND STAFF

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

750. Principles of Hematology. One credit hour. Winter Quarter. General prerequisites must include Anatomy 624 or its equivalent and the permission of the instructor must be obtained. Mr. Doan and staff.

A seminar and laboratory course meeting every second Monday afternoon from 2 to 5 during the Winter Quarter. The normal human and comparative blood pictures including a study of the normal hematogenic organs will be emphasized, but sufficient pathological material will be introduced to establish the limits for the range of normal. Each student will be expected to select some special phase of the field and develop it thoroughly with an adequate survey of the current literature, to be organized for presentation before the group at some time during the course. Independent work will be encouraged. Limited to a maximum of twenty-five students.

780. Minor Problems. Three to five credit hours. All Quarters. Library, conference and laboratory work. General prerequisites must include adequate preclinical training and satisfactory scholarship in regular required course work. Permission of the Director of the Department is required.

FOR GRADUATES

900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Medical Research. Autumn, Winter, and Spring Quarters. Library, conference, and laboratory work. General prerequisites must include acceptable courses in the basic preclinical sciences, and proof of an interest in and the ability to undertake the selected project. The student may spend a part or all of his time in research work and he must be registered in the Graduate School. Permission of the Director of the Department is required. Mr. Doan and staff.

METALLURGY
Office, 100 Lord Hall

PROFESSORS DEMOREST AND MUELLER, ASSOCIATE PROFESSOR LORD, ASSISTANT PROFESSOR RAUTIO

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These general prerequisites include fundamental courses in physics and metallurgy.

The following courses do not carry graduate credit for students who received the degree of Bachelor of Metallurgical Engineering from The Ohio State University: 605, 606, 610, 620, 650, 651, 701, 705, 706, 709, 713, 714, 715, 720.

605. Iron and Steel Metallurgy. Three credit hours. Winter Quarter. Three lectures or recitations each week. General prerequisites must include Metallurgy 651. Mr. Demorest, Mr. Rautio.

Lectures and problem work on the production of pig iron, open hearth, bessemer and electric steel and malleable cast iron and the rolling and forging of steel shapes. Calculation of furnace charges and application of thermodynamics to the equilibria approached in metallurgical operations.

Given in the Summer of 1943.

606. Principles of Metallography. Three credit hours. One Quarter. Autumn and Spring. Two lectures and four hours of laboratory each week. General prerequisites must include two Quarters of college chemistry. Mr. Lord.

An elementary course in physical metallurgy. Study of structures and equilibrium relations of metals and alloys by use of the microscope. Crystalline structure and physical properties of metals and alloys and changes produced therein by temperature. Problems on the quantitative distribution of structural features. Construction and significance of equilibrium diagrams. In the laboratory, metals and alloys are melted and cast and specimens are prepared for microscopic examination to correlate structure with composition and treatment.

610. Non-ferrous Metallurgy. Five credit hours. Spring Quarter. Five recitations each week. General prerequisites must include one year of college chemistry. Mr. Mueller.

Metallurgy and properties of the common non-ferrous metals. The chemical principles of the reduction of base metals from their ores. Refining and preparation for the market from the standpoint of physical and operative metallurgical principles. The igneous solution of impurities and concentration of precious metals in common base metals from the standpoint of theoretical equilibrium diagrams. The common hydro-metallurgical processes for copper, zinc, gold, and silver, and their possible applications to other metals. General principles of electro-metallurgy of the common metals for igneous and hydro-metallurgical applications. The study of slags and their equilibrium diagrams as related to the reduction of ores, refining of base metals and relation of slags to furnace and ladle linings.

620. Principles of Ore Dressing and Coal Cleaning. Five credit hours. Autumn Quarter. Four lectures or recitations and one three-hour laboratory

period each week. General prerequisites must include a course in descriptive mineralogy. Mr. Mueller.

An introduction to the field of mineral dressing. Fundamental principles of mineral and coal preparation for economic uses. Principles and design of crushers and grinders. Wet and dry classifiers and screens. Principles of mineral separations by various processes, such as use of jigs, tables, magnetic and electrostatic separators, trough separators and flotation. Principles and equipment used for settling, thickening and filtration of concentrates, tailings and coal. Flow sheets of plants.

650. Pyrometry. Two credit hours. One Quarter. Autumn and Winter. One lecture or recitation and one three-hour laboratory period each week. Mr. Lord.

Lectures, laboratory, and problem work on the calibration and use of resistance thermo electric, optical, and total radiation pyrometers.

Given in the Summer of 1943.

651. Fuels. Three credit hours. One Quarter. Autumn and Winter. Three lectures or recitations each week. Mr. Demorest, Mr. Mueller, Mr. Rautio.

Origin and manufacture of solid, liquid and gaseous fuels. Chemical compositions and variations of fuels. Carbonization and destructive distillation processes. Gasification processes. Thermochemistry and thermodynamics of combustion and gas reactions with much problem work.

Given in the Summer of 1943.

665. General Metallurgy. Five credit hours. Spring Quarter. Five lectures or recitations each week. General prerequisites must include two Quarters of college chemistry. Mr. Mueller.

Metallurgy of iron, steel, copper, lead, zinc, gold, silver, aluminium, and magnesium. Chemical and physical principles of the reduction of the metals from their ores, and refining and alloying of these metals. General principles of hydro-metallurgy and electro-metallurgy of these metals. Typical examples studied in detail.

701. Metallography of Iron and Steel. Four credit hours. Winter Quarter. Two lectures or recitations and two three-hour laboratory periods each week. General prerequisites must include Metallurgy 606. Mr. Lord.

Physical metallurgy applied to iron-carbon alloys, steels, and cast iron. Continuation of Metallurgy 606 with specific reference to iron-carbon alloys. Iron and steel terminology and conventional methods of heat treatment are studied from the standpoint of equilibrium and structure changes. Laboratory work in the development of the technique of taking photomicrographs of carbon steels in annealed and heat treated condition.

Given in the Summer of 1943.

702. Metallography of Special and Alloy Steels. Three credit hours. Autumn Quarter. Two lectures or recitations and one three-hour laboratory period each week. General prerequisites must include Metallurgy 701. Mr. Lord.

A continuation of Metallurgy 701 and introduction into the general subject of alloy steels. Lectures on effects of alloying other than carbon in steels. Special treatments, such as case carburizing and nitriding and the metallographic and structural features and equilibrium relationships involved. Laboratory work in measuring critical and transformation temperatures, practical carburizing, and heat treatment to secure specified structures and physical properties.

705. Metallurgical Construction. Four credit hours. Winter Quarter. Two lectures or recitations and three two-hour laboratory periods each week. General prerequisites must include Metallurgy 651, 605, 720, 610, or 655. Mr. Mueller.

Principles, practice and design of concentrators and coal-washing plants. Study of flow sheets for milling processes; location of plants and accessory equipment. Relation of plants to climatic and topographic conditions, health hazards and power facilities. Consideration of equipment for various conditions and purposes, labor requirements and housing of same.

Given in the Summer of 1943.

706. Metallurgical Construction. Four credit hours. Spring Quarter. Two lectures or recitations and two three-hour laboratory periods each week. General prerequisites must include Metallurgy 705. Mr. Demorest, Mr. Mueller.

Option: continuation of Metallurgy 705 with special reference to operation, control, costs, and handling of materials; or lectures, recitations, and drawing-room practice on the principles, practice, and design of metallurgical furnaces and plants with special reference to refractories and heat transfer.

709. Advanced Fuel Testing and Problems. Four credit hours. Autumn Quarter. Two lectures and two three-hour laboratory periods each week. General prerequisites must include Metallurgy 651. Mr. Demorest, Mr. Mueller.

Problems and advanced laboratory work in fuel and gas testing. Thermodynamics of combustion and fuel production and utilization. Gas distribution and corrosion of pipes.

713. The Production of the Light Metals. Three credit hours. Winter Quarter. Three lectures or recitations each week. General prerequisites must include Metallurgy 605 and 651. Mr. Demorest, Mr. Mueller.

Lectures and problem work on the light metal ores and their preparation and the production and refining of the metals.

Given in the Summer of 1943.

714. The Physical Metallurgy of the Light Metals and Their Alloys. Three credit hours. Spring Quarter. Two lectures and one three-hour laboratory period each week. General prerequisites must include Metallurgy 701. Mr. Lord.

The study of the physical properties, the metallography and heat treatment of the light metals and their alloys.

715. The Making and Shaping of Steel. Three credit hours. Winter Quarter. Three lectures each week. General prerequisites must include Metallurgy 605. Mr. Demorest, Mr. Rautio.

Lectures and problems on the making of steel in the Bessemer, Electric and Open Hearth furnaces from the Thermodynamic point of view and the metallurgical aspects of shaping of steel.

Given in the Summer of 1943.

720. Advanced Ore Dressing. Three credit hours. Winter Quarter. Two lectures and one three-hour laboratory period each week. General prerequisites must include Metallurgy 620. Mr. Mueller.

Design of flow sheets for ore concentration, coal cleaning and non-metallic mineral separation. The general technique of cyanidation of gold ores and other leaching processes and the refinish of the recovered products.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Metallurgy. Autumn, Winter, and Spring Quarters. Mr. Demorest, Mr. Mueller, Mr. Lord, Mr. Rautio.

MINE ENGINEERING

Office, 219 Lord Hall

PROFESSORS NOLD AND O'ROURKE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

The following courses do not carry graduate credit for students who received the degree Bachelor of Mine Engineering from The Ohio State University: 601, 602, 603, 702.

601. Prospecting and Preliminary Operations. Three credit hours. Autumn Quarter. Three recitations each week. General prerequisites must include a course in geology. Mr. Nold.

Prospecting and boring, their geologic and economic interpretation. Supporting excavations and the materials used.

602. Explosives and Rock Work. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include a course in chemistry and general geology.

Explosives, quarrying, tunnelling, shaft sinking, dredging and excavating machinery.

603. Development and Methods of Mining. Four credit hours. Spring Quarter. Four recitations each week. General prerequisites must include Mine Engineering 602. Mr. Nold.

Development, location of openings, methods of mining, etc.

Not open to students who have credit for Mine Engineering 701.

702. Mine Operations. Five credit hours. Autumn Quarter. Five recitations each week. General prerequisites must include Mine Engineering 701 or 603 and Electrical Engineering 642 and 643. Mechanical Engineering 673 must be taken concurrently. Mr. Nold.

Drainage, haulage, hoisting, ventilation, illumination, mine gases, and explosions.

721. Petroleum Engineering. Three credit hours. Autumn Quarter. Three recitations each week. General prerequisites must include a course in geology and a course in physics. Mr. O'Rourke.

Prospecting, drilling, and development of oil and gas fields, oil recovery methods.

722. Petroleum Engineering. Three credit hours. Winter Quarter. Two recitations and one two-hour laboratory period each week. General prerequisites must include Mine Engineering 721. Mr. O'Rourke.

Power gathering systems, preparation of crude petroleum for market, storage, transportation. Laboratory work in examining and testing crude petroleum and petroleum bearing rocks.

750. Mine Investigations. Three to ten credit hours. Autumn, Winter, and Spring Quarters. Conference, library, and laboratory work. In addition to the general prerequisites, the approval of the instructor must be obtained. This course may be repeated until the student has accumulated not to exceed twenty-four credit hours. Mr. Nold, Mr. O'Rourke.

a. Study and Investigation of Some Phases of Mine Development and Operation.
b. Study of Mine Ventilation and Laboratory Work with Ventilating Equipment.
c. Study of the Engineering Problems of Petroleum and Natural Gas Exploration, Production, and Transportation.
d. Design of Mines, Mining Plants, or Planning of Petroleum and Natural Gas Field Development.
e. Mine Examinations and Reports, including estimation of mineral reserves, valuation reports, costs, and administration.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Mine Engineering. Autumn, Winter, and Spring Quarters. Mr. Nold, Mr. O'Rourke.

Library, conference, laboratory, and field work on some phase of mining or mine operations.

MINERALOGY

Office, 115 Lord Hall

PROFESSOR McCAUGHEY, ASSOCIATE PROFESSOR BRANT

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include fundamental courses in crystallography and mineralogy.

601. Advanced Crystallography. Five credit hours. Autumn Quarter. Mr. McCaughey.

Study of the thirty-two crystal groups and their representative crystals. Structure of crystals as determined by X-ray analysis. Laboratory practice with the two circle goniometer in the measurement of crystals and in the drawing and projection of crystals.

605. Thermochemical Mineralogy. Three credit hours, Winter Quarter. Four credit hours, Autumn Quarter. Three or four lectures each week. General

prerequisites must include an acceptable course in physical chemistry. Mr. McCaughey.

Thermal properties of minerals, their formation and transformation in silicate mixtures.

606. Advanced Thermochemical Mineralogy. Three credit hours. Spring Quarter. Three lectures each week. General prerequisites must include Mineralogy 605. Mr. McCaughey.

Continuation of Mineralogy 605. Formation and solid solution of silicate minerals in multiple component systems.

Given in the Summer of 1943.

621. Microscopic Mineralogy. Five credit hours. One Quarter. Autumn and Winter. Two lectures and three two-hour laboratory periods each week. General prerequisites must include a course in descriptive mineralogy and a college course in physics, covering light. Mr. McCaughey, Mr. Brant.

The use of a polarizing microscope in the identification of minerals in fine powder and thin section. Determination of the optical constants of minerals and crystallized substances with the polarizing microscope.

622. Microscopic Petrography. Four credit hours. Spring Quarter. Two lectures and two two-hour laboratory periods each week. General prerequisites must include Mineralogy 621. Mr. McCaughey, Mr. Brant.

Use of the petrographic microscope in the identification of minerals in thin sections of rocks. Microscopic investigation of igneous metamorphic and sedimentary rocks, correlating texture, mineral composition, alteration and geological agencies affecting these.

631. Mineralogical Investigations. Three to five credit hours. One Quarter. Autumn, Winter, Spring. Library, conference, and advanced laboratory work. General prerequisites must include Mineralogy 621. Mr. McCaughey.

a. Microscopic Petrography. Study and investigation of igneous, metamorphic, and sedimentary rocks in thin section.

b. Soil Mineralogy. Mineralogical investigation of loose rock, such as soils, sand, and clays.

c. Applied Microscopic Mineralogy. Application of the principles of microscopic mineralogy to the determination of melting and transformation temperature of minerals; microscopic study of refractories, ceramic products, and glasses.

d. X-ray Crystal Analysis. Practice in the application of X-rays to the study of minerals and crystallized materials. Calculation for and determination of the fine structure of crystals.

654. X-rays and Crystal Structure. Four credit hours. Winter Quarter. Four lectures and recitations each week. General prerequisites must include calculus and one year of college physics. Given in alternate years. Mr. Blake, Mr. McCaughey, Mr. Harris.

This course is designed for those students in physics, chemistry, and mineralogy who intend to do research work in crystal structures and X-ray analysis.

This course is the same as Chemistry 654 and Physics 654.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION." page 45.

950. Research in Mineralogy and Petrography. Autumn, Winter, and Spring Quarters. Library, conference, and laboratory. Mr. McCaughey, Mr. Brant.

MUSIC

Offices, 1, 2, 3, 4 Page Hall

PROFESSORS WEIGEL, DIERCKS, LEEDER, AND M. E. WILSON, ASSISTANT PROFESSORS DIERKER, GILLILAND, HARDESTY, JONES, KOB, McBRIDE, THOMAS, AND WHITCOMB, MISS KUEHEFUHS, MR. WORLEY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

Detailed information concerning these prerequisites follows:

Requirements for Admission to Graduate Work in Music

1. One hundred hours of acceptable academic work, including English, Science, History, Psychology, etc.
   (a) Students majoring in Music Education should also have courses in the theory of education and adequate preparation in the field of Music Education.
   (b) Students majoring in the History of Music should also have a reading knowledge of either French or German sufficient for purposes of research.
2. Seventy hours of the theory of music, including a satisfactory amount of sight-singing and ear-training, harmony, analysis and form, history of music, conducting and instrumentation.
3. Twenty hours of applied music, including
   (a) for majors in Music Education, a degree of advancement in piano and voice satisfactory to the department:
   (b) for majors in the History of Music, an acquaintance with instrumental literature and performance ability on some instrument (preferably piano) satisfactory to the department.
4. A period of at least one year between the awarding of the bachelor's degree and completion of the requirements for the master's degree, preferably before the beginning of graduate study; this period should be spent in music teaching, and, in the case of majors in music education, must be so spent.

Requirements for the Master of Arts Degree

1. Music Education (General)
   (a) Music—15 hours from the following group, recommended according to the interest and preparation of the student.
   Supervision (612)—3 hours; (613)—3 hours; (647)—3 hours: (624)—5 hours; (623)—5 hours
   Conducting and Problems (646)—3 hours; (648 or 649)—3 to 6 hours; (642)—3 hours; (643)—3 hours
   History and Appreciation (601)—3 hours; (603)—3 hours; (605)—3 hours; 606)—3 hours; (607)—3 hours
   Other courses chosen in consultation with the department
   (b) Music—Minor Problems (650)—5 hours
   (c) Research in Music (950)—10 hours
   (d) Electives in other fields—15 hours
   Under certain circumstances, a part of this requirement may be taken in music
2. Music Education (Instrumental)
   (a) Music—15 hours from the following groups; recommended according to the interest and preparation of the student.
   Instrumental Music (644)—3 hours; (641)—3 hours; (645)—3 hours
   Conducting (642)—3 hours; (643)—3 hours
   Orchestration (631)—3 hours; (632)—3 hours
   Vocal Materials and Methods (624)—5 hours
   History and Appreciation (601)—3 hours; (603)—3 hours; (605)—3 hours; (606)—3 hours; (607)—3 hours
   (b) Music—Minor Problems (650)—5 hours
   (c) Research in Music (950)—10 hours
   (d) Electives in other fields—15 hours
3. In History of Music
   (a) Music—15 hours from the following groups; recommended according to the interest and preparation of the student.
   History of Music (601)—3 hours; (603)—3 hours; (605)—3 hours; (606)—3 hours; (607)—3 hours
   Music electives, as advised—9 hours
   (b) Music—Minor Problems (650)—5 hours
   (c) Research in Music (950)—10 hours
   (d) Electives in other fields—15 hours

601. The Romanticists. Three credit hours. Autumn Quarter. Three lectures each week. In addition to the general prerequisites, permission of the instructor must be obtained. Mr. M. E. Wilson.

The music of the romantic period in Germany and France.

Given in the Summer of 1943.

603. Modern Music. Three credit hours. One Quarter. Autumn and Winter. Three lectures each week. In addition to the general prerequisites, permission of the instructor must be obtained. Mr. M. E. Wilson.

A brief survey of modern developments with special reference to the composers of France and Russia.

Given in the Summer of 1943.

†**605. History of Choral Music.** Three credit hours. Winter Quarter. Three lectures each week. In addition to the general prerequisites, permission of the instructor must be obtained. Mr. M. E. Wilson.

Choral composers and literature with special consideration of the sixteenth and seventeenth centuries.

Given in the Summer of 1943.

606. Chamber Music—Haydn to Brahms. Three credit hours. Winter Quarter. Three lectures each week. General prerequisites must include permission of the instructor. Mr. M. E. Wilson.

A survey of the chamber music of the classical and romantic periods with performance, analysis, and discussion.

Given in the Summer of 1943.

607. The Classic Period. Three credit hours. Autumn Quarter. Three lectures each week. General prerequisites must include courses in history and appreciation of music, or permission of the instructor. Mr. M. E. Wilson.

A study of organ and other keyboard compositions and of chamber music and early orchestra writing in Germany, Italy, France, and England in the period 1650 to 1725.

†**612. Supervision of Music in the Elementary Schools.** Three credit hours. Three recitations each week. Spring Quarter. Open to graduate students majoring in music. Other persons of maturity and experience may elect this course by permission of the instructor. Mr. Leeder.

A study of the specific problems of music supervision with special attention given to curriculum construction.

Given in the Summer of 1943.

†**613. Supervision of Music in Secondary Schools.** Three credit hours. Open to graduate students majoring in music. Other persons of maturity and experience may elect this course by permission of the instructor. Mr. Leeder.

This course is designed to study evaluation criteria and the problems of the music supervisor in the secondary and junior high school.

Given in the Summer of 1943.

615. Methods of Class Instruction in Piano. Three credit hours. Winter Quarter. Consent of the department is required. Miss Jones.

Examination and evaluation of current methods of instruction and materials. This course is designed to provide observation and practice of class instruction in piano for teachers of experience.

Not open to students who have credit for Music 444.

Given in the Summer of 1943.

623. Music Literature for the Elementary School. Five credit hours. Winter Quarter. Five recitations each week. Miss Dierker, Miss Thomas.

Designed to familiarize the student with song and listening material suitable for use in the elementary school. Study of material supplementary to that used in Music 528.

Not open to students who have credit for Music 609.

Given in the Summer of 1943.

† Not given during the academic year, 1943-1944.

624. Music Education in the Secondary Schools. Five credit hours. One Quarter. Autumn and Spring. Five recitations each week. Mr. Leeder, Mr. McBride.

Music literature for use in the secondary schools and how to present it. A course for special teachers and supervisors of music.

Not open to students who have credit for Music 610 and 611.

Given in the Summer of 1943.

630. Instrumentation. Three credit hours. Autumn Quarter. Three recitations each week. Mr. Worley.

The study of the instruments of the orchestra and band together with the practical study of their use in small ensembles and beginning instrumental organizations. A number of observations of elementary school organizations and some analysis of existing material for these organizations will be required.

631. Orchestration I. Three credit hours. Winter Quarter. Three recitations each week. Mr. Hardesty.

Scoring for string orchestra, salon orchestra and full symphony orchestra including an analysis of the scores of Mozart, Beethoven, Wagner, Berlioz, Rimsky-Korsakov and Ravel. Attendance at a number of rehearsals and concerts of symphony orchestras will be required.

Given in the Summer of 1943.

632. Orchestration II. Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include Music 631 or equivalent. Mr. Whitcomb.

Scoring for woodwind and brass instruments in various combinations and for wind band including an analysis of the scores and arrangements of Stravinsky, Winterbottom, Godfrey, Leidzen, Cailliet and Gould. Attendance at a number of rehearsals and concerts of symphonic bands will be required.

641. Instrumental Music Education. Three credit hours. Autumn Quarter. Three recitations each week. Mr. Weigel, Mr. McBride.

Organization and methods for the teaching of instrumental music in the elementary and secondary school. The school band and orchestra, the preparatory instruments, instrumental class lessons, the sections, solo and ensemble, the library, public performance, public relations and general administration. Observation in the public schools.

Given in the Summer of 1943.

642. Elementary Instrumental Conducting. Three credit hours. Winter Quarter. Three recitations each week. Mr. Weigel.

The basic technique of the baton with reference to mood, tempo, rhythms, nuance and phrasing. Music suitable for junior and senior high school will be studied. A syllabus of selected literature and reading assignments will be used as a basis of study.

Given in the Summer of 1943.

643. Advanced Instrumental Conducting. Three credit hours. Spring Quarter. Three lectures and drill periods each week. Mr. Weigel.

This course aims to develop the power to interpret the larger forms of orchestral literature and to read from full score; it includes problems of tempo, phrasing, nuance, balance, timbre, and special study of baton technique. Qualified students will be given opportunity to conduct one of the University Orchestras.

***644. Instrumental Problems I.** Three credit hours. General prerequisites must include permission of the instructor.

Problems and procedures in instrumental organizations. A full orchestra will be available for daily observation and for demonstrations.

Students may not register for this course unless they have enrolled for Music B.

Special emphasis will be placed upon the clinical aspects of the orchestra performances and rehearsals.

†**645. Instrumental Problems II.** Three credit hours. General Prerequisites must include permission of the instructor. Mr. Weigel.

Continuation of Music 644 with different materials.

This course may be taken either preceding or following Music 644.

Given in the Summer of 1943.

* Not given in 1943-1944.

† Not given during the academic year, 1043-1944.

646. Advanced Vocal Conducting. Three credit hours. Winter Quarter. Three recitations each week. Mr. Gilliland.

Practice in conducting the larger form of choral literature for the accompanied and unaccompanied chorus. It includes problems of tempo, phrasing, nuance, dynamics, balance and special study of baton technique. A syllabus of selected choral works and readings will be used as a basis for study.

Given in the Summer of 1943.

†647. Problems in Music Education. One to five credit hours. Mr. Leeder.

Study of the problems encountered in the teaching and supervising of music. Additional investigation of the course of study, special programs, the integrated course, etc.

This course may be repeated for credit at the discretion of the department.

Given in the Summer of 1943.

***648. Choral Problems I.** Three credit hours. General prerequisites must include the permission of the instructor.

Study of the technique of handling choruses of high school age and above. A chorus will be available for daily observation and for demonstrations.

Students may not register for this course unless they have enrolled for Music A.

Special emphasis will be placed upon the clinical aspects of the chorus performances and rehearsals.

†649. Choral Problems II. Three credit hours. General prerequisites must include the permission of the instructor. Mr. Diercks.

Continuation of Music 648 with different materials.

This course may be taken either preceding or following Music 648.

Given in the Summer of 1943.

650. Minor Problems. One to five credit hours. All Quarters. In addition to the general prerequisites, the consent of the department must be obtained. All instructors.

Investigation of minor problems in the field of music.

Given in the Summer of 1943.

655. Music in Radio Broadcasting. Three credit hours. Autumn Quarter. Three lectures each week. General prerequisites must include the permission of the instructor. Mr. M. E. Wilson.

A discussion of practical problems involved in broadcasting different types of instrumental and vocal solo and ensemble groups and the selection and coaching of such groups. The timing and arrangement of programs. Costs and copyright laws affecting materials. Proper use of microphones and other equipment. Use and appreciation of radio music in the schools.

Given in the Summer of 1943.

†656. Principles of Music Learning. Three credit hours. Autumn Quarter. Three recitations each week. Mr. M. E. Wilson.

An analysis of the factors in learning to appreciate and perform music in early childhood and through adult life.

Given in the Summer of 1943.

661. Form and Analysis. Three credit hours. Autumn Quarter. Three recitations each week. Mr. Kob, Miss Kuehefuhs.

A study of the design and harmonic structure of simple and complex forms of music composition. Standard works analyzed.

Not open to students who have credit for Music 468.

Given in the Summer of 1943.

†662. Counterpoint. Three credit hours. Autumn Quarter. Three recitations each week.

Strict counterpoint in two and three parts.

Not open to students who have credit for Music 472.

Given in the Summer of 1943.

†663. Counterpoint. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include Music 662.

Free counterpoint.

Composition of two-part canon and two- and three-part inventions in the style of Bach.

Not open to students who have credit for Music 474.

Given in the Summer of 1943.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

665. Advanced Harmonic Analysis. Three credit hours. Spring Quarter. Three recitations each week. General prerequisite must include Music 661. Miss Jones.

Study of modern harmonic idioms and forms.

Given in the Summer of 1943.

666. Teaching of Theory in Secondary Schools. Three credit hours. Autumn Quarter. Open to graduate students and undergraduates who have had a course in advanced harmony and Music 624. Mr. Kob.

Basic principles and problems in the teaching of music theory. The presentation of a correlated course in sight singing, dictation, and harmony in secondary schools.

667. Advanced Keyboard Harmony. Three credit hours. Winter Quarter. Three recitations each week. Mr. Kob.

Chromatic modulation, harmonizations at sight of melodies, transposition and improvisation.

Given in the Summer of 1943.

†750. Music Workshop. Eight credit hours. Open only to graduate students.

A music workshop created to provide an opportunity for graduate students to participate in and study the clinical and directional problems of the secondary school band and chorus. Special attention will be given to study of materials, methods and program building.

Students must register for this work according to their major interest: for choral problems and for band problems.

Given in the Summer of 1943.

NOTE: For course in Acoustics for Students of Music, see the Department of Physics, Course 645.

For course in the Psychology of Music, see the Department of Psychology, Course 667.

For course in the Philosophy of Education, see the Department of Education, Course 607.

For course in the History of Education, see the Department of Education, Course 632.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION." page 45.

950. Research in Music. Autumn, Winter, and Spring Quarters.

Original investigation of theory and history or of practices in the field of specialization. Research is possible under the general heads: Instrumental Aspects of Music Education and Instrumental Conducting, Mr. Weigel; Music Education, Mr. Leeder; Piano Methods, Miss Jones; Vocal Music, Mr. Diercks; Vocal Conducting, Mr. Gilliland; History of Music and Musical Aspects of Psychology and Aesthetics, Mr. M. E. Wilson; Music Theory, Mr. Kob.

Given in the Summer of 1943.

NOTE: For course in the Preparation of Theses, see the Department of Education, Course 802.

NATIONAL SERVICE COURSES

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

600. Organization and Direction of the Marching Band (Music). Three credit hours. Spring Quarter. General prerequisites must include Music 641 or permission of the instructor. Mr. Weigel, Mr. Whitcomb.

This course is designed to prepare the music supervisor and advanced instrumental music student to meet the requirement for direction of bands in service, secondary school, and college.

† Not given during the academic year, 1943-1944.

The course will consists of the organization and direction of the band, its function in maneuvers, parades, military reviews, field music, and marching formations.

Given in the Summer of 1943.

602. Organization and Leadership of Community Singing (Music). Three credit hours. Spring Quarter. General prerequisites must include Music 646 or the equivalent. Mr. Diercks, Mr. Gilliland, Mr. Leeder.

A study of the problems involved in organizing, selecting materials for and conducting community singing.

Given in the Summer of 1943.

609. Teaching Pre-Flight Aeronautics in the Secondary School (Education). Five credit hours. All Quarters. Lectures, assigned readings, individual problems, laboratory work. General prerequisites must include teaching experience in science or mathematics or pre-flight aeronautics in a secondary school, or two Quarters of college physics and twelve hours in education and psychology or the equivalent. Mr. Cahoon, Mr. Fawcett, Mr. Ramseyer.

This course will include such topics as civil air regulations, navigation, meteorology, and the elements of aerodynamics as suggested by the Civil Aeronautics Administration. These will be given by instructors certified by the Civil Aeronautics Administration. In addition the course will include such professional topics as use of visual aids, appropriate demonstrations and pupil laboratory experiments, and information concerning sources of equipment and teaching aids.

Given in the Summer of 1943.

NURSING

PUBLIC HEALTH NURSING

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," see page 45.

602. Public Health Nursing and Health Service in the Family. Five credit hours. One Quarter. Autumn and Spring. Five class meetings each week. Miss Leazenbee.

A study of the history and development of Public Health Nursing together with a critical evaluation of the aims, objectives, and underlying principles involved.

PATHOLOGY

Office, 310 Hamilton Hall

PROFESSORS von HAAM, SPOHR (EMERITUS), AND REINHART, ASSITANT PROFESSORS DAVIDSON, SHINOWARA, AND HARTWELL, MISS WATSON, MR. HAMPTON

Prerequisites for Graduate Work: Graduate work in *pathologic anatomy* is offered to students who are in possession of an M.D. degree or students in the College of Medicine of The Ohio State University. Students desiring to register during the Summer Quarter must have been registered previously in the College of Medicine of The Ohio State University or some other first grade school of medicine. The prerequisites for major graduate work in pathologic anatomy for students not in possession of an M.D. degree include the successful completion of the freshman schedule of the College of Medicine or its equivalent and passing of Pathology 624 (Principles of Pathology) or its equivalent with not less than B standing.

For students majoring in some other science and desiring courses in *pathologic anatomy*, permission must be obtained in every specific case from the chairman of the department.

For both the Master's degree and the Ph.D. degree in *pathologic anatomy* a thorough training in autopsy technic and surgical pathology is required in addition to the successful completion of course work and the required thesis or dissertation. Such training is obtained in one of the hospital laboratories affiliated with the Department of Pathology.

Graduate work in *clinical pathology* is offered to students who are in possession of a B.A. or B.S. degree from any recognized college of the United States. The prerequisites for major graduate work in clinical pathology are a major in chemistry or bacteriology and courses meeting the requirements for admission to the College of Medicine.

In order to obtain a Master's or Ph.D. degree in clinical pathology a thorough practical training in all laboratory work as performed in the various hospital laboratories is required. In addition to the regular course work and required thesis or dissertation the candidate must

spend one year in the laboratory of a hospital affiliated with the Department of Pathology and must be able to qualify for certification by the Board of Medical Technologists.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

Courses 603-626 inclusive are open only to students who are doubly registered in the College of Medicine and the Graduate School, to the extent of fifteen Quarter hours.

603. Clinical Pathology. Three credit hours. Spring Quarter. Two lectures and four laboratory hours each week. General prerequisites must include Bacteriology 641-642 and Physiological Chemistry 601-602. Mr. Reinhart, Mr. Shinowara, Miss Watson.

Sputum, urine, spinal fluid, gastric contents, feces, animal parasites and ova, transudates and exudates, blood cultures, blood typing and matching, miscellaneous examinations.

Given in the Summer of 1943.

604. Clinical Pathology. Three credit hours. Autumn Quarter. Two lecture and four laboratory hours each week. General prerequisites must include Bacteriology 641-642 and Physiological Chemistry 601-602. Mr. Reinhart, Mr. Shinowara, Miss Watson.

Blood, a study of unstained and stained specimens. Special blood pathology. Blood chemistry and functional tests. Sero-diagnostic methods.

616-617-618. Research in Clinical Pathology. Three credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include Pathology 603-604. Mr. Reinhart, Mr. Shinowara, Miss Watson.

Study of new methods and tests on materials collected in the hospital wards and out-patient department.

624. General Pathology. Five credit hours. Winter Quarter. Three lecture and six laboratory hours each week. Mr. Hartwell and staff.

Detailed study of degenerative, circulatory, and inflammatory lesions. Tumor pathology.

625. Special Pathology. Five credit hours. Spring Quarter. Three lecture and six laboratory hours each week. General prerequisites must include Pathology 624. Mr. Davidson and staff.

Pathology of the circulatory, respiratory, and gastro-intestinal systems.
Given in the Summer of 1943.

626. Special Pathology. Five credit hours. Autumn Quarter. Three lecture and six laboratory hours each week. General prerequisites must include Pathology 625. Mr. Davidson and staff.

Pathology of the genito-urinary, reproductive, endocrine, reticulo-endothelial, nervous, and skeletal systems.

653-654. Clinical Pathology. Three credit hours. 653, Spring Quarter; 654, Autumn Quarter. One lecture and four laboratory hours each week. General prerequisites must include acceptable courses in bacteriology and chemistry. Mr. Reinhart, Mr. Shinowara, Miss Watson.

A study of the changes in the blood, secretions, serums, and exudates of the body brought about by disease.

Pathology 653 given in the Summer of 1943.

661. General Pathology. Five credit hours. Winter Quarter. Three lecture and six laboratory hours each week. Mr. Hartwell and staff.

Detailed study of degenerative, circulatory, and inflammatory lesions. Tumor pathology.

662. Special Pathology. Five credit hours. Spring Quarter. Three lecture and six laboratory hours each week. General prerequisites must include Pathology 661. Mr. Davidson and staff.

Pathology of the circulatory, respiratory, and gastro-intestinal systems.
Given in the Summer of 1943.

663. Special Pathology. Five credit hours. Autumn Quarter. Three lecture and six laboratory hours each week. General prerequisites must include Pathology 662. Mr. Davidson and staff.

Pathology of the genito-urinary, reproductive, endocrine, reticulo-endothelial, nervous, and skeletal systems.

725. Surgical Pathology. One credit hour. Winter Quarter. One lecture each week. Mr. Hampton.

A course correlating clinical symptomatology with the pathology of specimens removed by major chest and abdominal surgery.

726. Medical Pathology. One credit hour. Spring Quarter. One lecture each week. Mr. Hampton.

A course correlating the symptomatology of internal diseases with organ pathology.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Pathology. Autumn, Winter, Spring, and Summer Quarters. General prerequisites must include accepted courses in basic preclinical sciences. Mr. Reinhart and staff.

PHARMACY

Office, 104 Pharmacy and Bacteriology Building

PROFESSORS CHRISTENSEN, DYE (EMERITUS), AND HINER, ASSOCIATE PROFESSORS BROWN AND GUTH, ASSISTANT PROFESSOR WILLIAMS, MR. SPAIN

Prerequisites for Graduate Work: The student must have graduated with high standing from an accredited college of pharmacy whose entrance and graduation requirements are equivalent to those in effect for the College of Pharmacy of The Ohio State University.

Requirements for the Degree Master of Science in Pharmacy:

(a) *Course of Study.* Not later than the first Quarter of residence the candidate shall submit to the Graduate Committee in Pharmacy his program of study. It must show the subject of the proposed thesis, and the courses to be undertaken in the field of specialization and in related fields.

(b) *Residence Requirement.* At least six Quarters of full-time graduate study will be necessary to meet the requirements for this degree. The student must be registered in the Graduate School during his entire period of residence for the degree.

(c) *Thesis.* A thesis embodying the results of independent investigations and of sufficient importance to justify publication in a technical journal is required. It is expected that about one-third of the time of the student should be devoted to research.

(d) *Examinations.* Examinations either oral or written or both covering the field of specialization, allied fields, and the thesis are conducted by an examining committee as a concluding basis for determining whether or not the candidate is recommended for the degree.

Requirements for the Degree Doctor of Philosophy:

(a) *Advisory Committee.* Graduate programs for this degree are under the general supervision of an advisory committee consisting of members of the staff of the College of Pharmacy and representatives from cognate departments.

(b) *Course of Study.* Not later than the fourth Quarter of residence the candidate shall submit to the advisory committee in Pharmacy his program of study. It must show the subject of the proposed dissertation, and the courses to be taken in the field of specialization and in two cognate fields.

(c) *Field of Specialization.* The special field of study may be elected from any of the four subdivisions of Pharmacy, namely, Pharmaceutical Chemistry, Pharmacognosy, Pharmacology, or Pharmacy.

(d) *Examinations.* The general examinations for admission to candidacy for the degree are conducted by a committee appointed by the Dean of the Graduate School, upon written request of the student's adviser (who acts as chairman). This committee must include at least one representative from each of the departments in which the student is taking his cognate studies. When the student's adviser decides that the student is ready for the general examinations he will so notify the office of the Graduate School in writing. The general examinations shall be both written and oral.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. Glandular Products. Three credit hours. One Quarter. Autumn and Spring. Three lectures and recitations each week. Mr. Spain.

Preparation, properties, standardization and uses of medicinal products obtained from organs and glands of animals.

602. Biological Products. Two credit hours. One Quarter. Autumn and Winter. Two lectures and recitations each week. Mr. Spain.

U.S.P. standards and legal requirements governing manufacture, standardization, storage, and distribution of toxins, antitoxins, serums and vaccines.

608-609. Materia Medica. Four credit hours each Quarter. 608, Spring; 609, Autumn. Four lectures and recitations each week. Mr. Christensen.

Lecture and recitation courses covering the fundamental facts in materia medica and including a discussion of the more commonly used drugs and preparations with a brief discussion of their pharmacology and therapeutic applications.

611. Pharmaceutical Analysis. Five credit hours. Spring Quarter. Two lectures, one recitation, and two three-hour laboratory periods each week. Mr. Guth.

A course in pharmaceutical chemistry dealing especially with fixed oils, fats, waxes, soaps, resins, volatile oils, etc., and the application of the polariscope, refractometer, etc., in the examination of commercial products.

612. Pharmaceutical Analysis. Five credit hours. Autumn Quarter. Two lectures, one recitation, and two three-hour laboratory periods each week. Mr. Guth.

The work of this Quarter deals largely with the pharmacopoeial assays and a general examination of various drug products.

617. Microscopical Pharmacognosy. Three credit hours. One Quarter. Winter and Spring. One lecture and recitation and two two-hour laboratory periods each week. Mr. Hiner.

A microscopical study of crude drugs, spices, food products, etc., and their adulterants.

618. Microscopical Pharmacognosy. Three credit hours. Spring Quarter. One lecture and recitation and two two-hour laboratory periods each week. Mr. Hiner.

The application of microchemical tests in the identification of cell inclusions and plant constituents such as organic acids, organic salts and alkaloids.

700. Minor Problems. Two to five credit hours. Winter Quarter. Staff.

Conference, library, and laboratory work.

Given in the Summer of 1943.

701. Minor Problems. Two to five credit hours. One Quarter. Autumn, Winter, Spring. Staff.

Conference, library, and laboratory work.

710. Technology. Three to six credit hours each Quarter. Autumn and Spring. Permission of the instructor is required. Conference, library, and laboratory work.

The student may obtain a maximum of eighteen credit hours in any one of the following special fields, but not more than twenty-four hours in the course.

(a) Problems in the manufacture of pharmaceutical preparations. Mr. Guth.

(b) Technological theories and principles with industrial applications. Mr. Guth.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

810. Problems on Drug Standardization. Three to six credit hours. Winter Quarter. General prerequisites and permission of the instructor. Conference, library, and laboratory work.

The student may obtain a maximum of eighteen credit hours in any one of the following special fields, but not more than twenty-four hours in the course.

(a) Biological methods. Mr. Christensen.
(b) Chemical methods. Mr. Christensen.
Given in the Summer of 1943.

816. Special Problems in Pharmacognosy. Three to six credit hours each Quarter. Autumn, Winter, Spring. General prerequisites and permission of the instructor. Conference, library, laboratory, and field work.

The student may obtain a maximum of eighteen credit hours in any one of the following special fields, but not more than twenty-four hours in the course.

(a) Macro and micro-analysis of medicinal plants. Mr. Hiner.
(b) Medicinal plant cultivation. Mr. Hiner.
Given in the Summer of 1943.

820. Special Problems in Pharmaceutical Chemistry. Three to six credit hours each Quarter. Autumn, Winter, Spring. General prerequisites and permission of the instructor. Conference, library, and laboratory work.

The student may obtain a maximum of eighteen credit hours in any one of the following special fields, but not more than twenty-four hours in the course.

(a) Synthetic organic medicinals. Mr. Guth.
(b) Chemistry of plant drug constituents. Mr. Guth.
(c) Advanced drug analysis. Mr. Guth.
Given in the Summer of 1943.

850. Seminar. One to four credit hours. Autumn, Winter, and Spring Quarters. Mr. Christensen, Mr. Guth, Mr. Hiner.

Round table discussions, oral and written reports dealing with recent advances in pharmacy.
Given in the Summer of 1943.

950. Research. Autumn, Winter, and Spring Quarters. Mr. Christensen, Mr. Guth, Mr. Hiner.
Given in the Summer of 1943.

PHILOSOPHY

Office, 320 University Hall

PROFESSORS AVEY, LEIGHTON (EMERITUS), CHANDLER, AND EVANS, ASSISTANT PROFESSOR REITHER, MR. WATERS, MR. LOWE

Prospective students are strongly recommended to prepare for graduate work in this department by taking related courses in other departments. Psychology is regarded as related to all courses in philosophy. The following are suggested as related courses in other departments. For students of logic and metaphysics: mathematics, and natural sciences, especially general and theoretical physics, general and historical chemistry, and evolution (Zoology 509); for students of ethics and the philosophy of religion: sociology, politics, and history; for students of the history of philosophy: European history, and the history of Greek, German, English, and French literatures. Students proposing to specialize in philosophy must previously have completed the equivalent of at least eighteen Quarter-credit hours in philosophy and psychology. In case of students whose main interest is in ethics, two Quarters' work in the principles of sociology may be accepted in partial fulfillment of the above requirement.

Candidates for the Ph.D. degree in Philosophy are required to present themselves for general examinations in the elements of the entire subject, and also for more intensive examinations on six of the following subdivisions:

1. Greek philosophy through Aristotle
2. Graeco-Roman philosophy from the death of Aristotle to Plotinus
3. Modern philosophy through Kant
4. Modern philosophy from Kant to the present (including Kant)
5. Ethics
6. Social and Political Philosophy

7. Methodology of the Sciences
8. Symbolic logic
9. Theory of knowledge
10. Metaphysics
11. Aesthetics
12. History and Philosophy of religion

The candidate's choice of topics shall be made in consultation with the department and shall be relevant to the topic of his thesis.

Philosophy 661, 662, or their equivalent, are required of all candidates for the Doctor's degree.

Students who hope to obtain the Master's degree in three Quarters should be well grounded in logic and in the history of philosophy. The program for the degree will normally include twenty-five to thirty-five hours constituting the major in philosophy, with the remainder of the required forty-five hours in an appropriate minor subject. The major work should round out the student's knowledge of the history of philosophy, acquaint him with some of the special fields of philosophy, and train him in independent work in the preparation of the required thesis.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION." page 45.

Courses bearing numbers 601 to 650 are historical; courses bearing numbers 651 to 700 are systematic.

601. Ancient Philosophy. Five credit hours. Autumn Quarter. Four meetings each week, a fifth at the option of the instructor. Mr. Chandler.

The development of philosophical thought from the Greeks through the Middle Ages. Most of the time is devoted to Greek Philosophy. A natural continuation of this course will be found in Philosophy 602.

602. Modern Philosophy to Hegel. Five credit hours. Winter Quarter. Four meetings each week, a fifth at the option of the instructor. Mr. Reither.

The development of philosophical thought from the Renaissance to the Nineteenth Century. A natural continuation of this course will be found in Philosophy 603.

Given in the Summer of 1943.

603. Philosophy since Hegel. Five credit hours. Spring Quarter. Four meetings each week, a fifth at the option of the instructor. General prerequisites must include Philosophy 602. Mr. Lowe.

The development of philosophical thought from the early Nineteenth Century to the present. Special attention is given to the relations between philosophy, scientific development, social movements, and literature.

***604. Recent and Contemporary Philosophy.** Three credit hours. Autumn Quarter. General prerequisites must include either Philosophy 601, 602, 603, or 656.

Philosophical movements of the day and their relation to current social problems.

***608. Philosophy and Poetry.** Three credit hours. Winter Quarter. Given in alternate years. General prerequisites must include ten hours in philosophy. Mr. Chandler.

A discussion of Lucretius, Dante's *Divine Comedy* and Goethe's *Faust*, for the light they throw on the history of thought and the nature of poetic excellence.

***617. The Philosophy and Religion of the Far East.** Three credit hours. Autumn Quarter. Mr. Avey.

A survey of the philosophic and religious ideas of India, China, and Japan from the earliest times to the present, and their influence upon the life and culture of these nations.

***623. Representative Greek Philosophers.** Five credit hours. Winter Quarter. General prerequisites must include Philosophy 601. Mr. Chandler.

A study of selected works of Aristotle.

***625. Representative Modern Philosophers.** Three credit hours. Winter Quarter. Given in alternate years. General prerequisites must include Philosophy 602. Mr. Reither.

A few representative works of classic thinkers of the period from Bacon and Descartes to Schopenhauer will be selected for intensive study.

* Not given in 1943-1944.

***628. The Platonic Tradition in European Thought.** Five credit hours.

A study of certain dialogues of Plato and of their influence upon aspects of Neo-Platonism, Christianity, the Florentine Academy, the Cambridge Platonists, the English poets.

649. Symbolic Logic. Four credit hours. Spring Quarter. General prerequisites must include a course in logic or consent of the instructor. Mr. Avey.

A study of the transition from the traditional forms of Aristotelian Logic to the symbolic methods of the Nineteenth and Twentieth Centuries.

*652. Philosophy of Science. Three credit hours. Winter Quarter. Given in alternate years. General prerequisites must include either five hours of philosophy and ten hours of science, or twenty hours of science.

A study and critical discussion of a few general interpretations of the methods and basic assumptions of the natural and social sciences.

*653. Philosophy of Religion. Five credit hours. Spring Quarter. Four meetings each week, a fifth at the option of the instructor. General prerequisites must include five hours of philosophy. Students are advised to take Philosophy 617 and 620 as a background for this course.

The psychical and social nature of religion; a systematic examination of the fundamental religious conceptions—the idea of God in relation to the idea of the world, the idea of man, and the problem of human destiny.

656. Principles of Social Ethics. Three credit hours. Winter Quarter. General prerequisites must include one of the following: five hours of philosophy or Psychology 621, Education 603 or 632, or ten hours of social science. Mr. Reither.

Systematic development of a philosophy of human values, and its application to the chief forms and activities of civilized life—industrial and economic activities, the state, education, culture, and religion. The philosophies of Fascism, Nazism, Communism, and Liberal Democracy.

*661. Metaphysics of Knowledge and Nature. Three credit hours. Autumn Quarter. Given in alternate years. General prerequisites must include two of the following: Philosophy 601, 602, 603, 623, 625. Mr. Avey.

A systematic consideration of the nature of scientific method and the scientific conception of nature in its bearings on the problems of man.

*662. Metaphysics of Personality and Values. Three credit hours. Winter Quarter. Given in alternate years. General prerequisites must include two of the following: Philosophy 601, 602, 603, 623, 625. Philosophy 661 will ordinarily precede this course. Mr. Chandler.

A systematic consideration of the nature of the self and society, the problem of values, and the problem of the meaning of existence as a whole.

*665. Philosophy of History. Three credit hours. Spring Quarter. General prerequisites must include ten hours in philosophy and ten hours in the social sciences. Mr. Chandler.

A discussion of the place of history in the system of human knowledge, the humanistic significance of the historical attitude, the concepts of civilization, culture, development, and progress. The aim of the course is to formulate a philosophy of culture.

*670. Pragmatism. Three credit hours. General prerequisites must include ten hours of education or philosophy. Class enrollment limited to fifty. Mr. Bode, Mr. Avey.

A study of the psychological motives and the historical setting from which pragmatism developed; the application of the point of view to the problems of knowledge, of conduct, of education, and religion. Special emphasis will be placed upon the writings of Dewey.

701. Minor Problems. Two to ten credit hours. Autumn, Winter, and Spring Quarters. Mr. Avey, Mr. Chandler, Mr. Lowe.

Investigation of minor problems in the history of philosophy or systematic philosophy. Students ordinarily expect to take this course for from two to five credit hours, but honors students may receive credit up to ten hours.

Topics for special study may be chosen from the following fields: ethics, logic, metaphysics, history of philosophy, religion (including Hebrew ideas and Christian origins), aesthetics.

Given in the Summer of 1943.

* Not given in 1943-1944.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These general prerequisites include acceptable foundation courses either in psychology, logic and ethics, or in the history of philosophy, and in some cases in all of these subjects.

801. Seminar in Systematic Philosophy. Three credit hours. Autumn Quarter. Mr. Chandler.

802. Seminar in Systematic Philosophy. Three credit hours. Winter Quarter. Mr. Avey.

803. Seminar in Systematic Philosophy. Three credit hours. Spring Quarter. Mr. Reither.

950. Research in Philosophy. Autumn, Winter, and Spring Quarters. All instructors.

Given in the Summer of 1943.

PHONETICS

(See Speech)

PHOTOGRAPHY

Office, 4 Brown Hall

ASSISTANT PROFESSOR DAVIS, MR. REBER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

625. Scientific Photography. Three credit hours. Spring Quarter. Two lectures and recitations and two two-hour laboratory periods each week. General prerequisites must include a year of elementary or general chemistry and in addition at least twenty Quarter hours in a scientific major. Mr. Davis, Mr. Reber.

This course is designed for students of physics, chemistry, astronomy, biology, and other sciences who need a knowledge of the principles and techniques of photography as an aid to their scientific work. Special attention is given to the nature of photographic processes, characteristics of photographic materials and the applications of photography to science. The laboratory exercises will be selected as far as possible to meet the needs of individual students.

Not open to students who have credit for Photography 725.

Given in the Summer of 1943.

650. Advanced Photography. Three credit hours. Spring Quarter. Two lectures and two three-hour laboratory periods each week. General prerequisites must include a course in photographic processes or Photography 625 or 725. Mr. Davis, Mr. Reber.

A continuation of Photography 511 or 625, dealing mainly with projection printing, portraiture, special effects, photo-engraving, lens testing, color photography, miniature camera work and motion pictures.

Not open to students who have credit for Photography 750.

Given in the Summer of 1943.

699. Minor Problems in Photography. Three to five credit hours. Autumn and Winter Quarters. Conference, library and laboratory work. General prerequisites must include a course in photographic processes or Photography 625 and 650, and fifteen Quarter hours of elementary or general chemistry and/or physics and consent of the instructor. This course may be repeated until the student has accumulated not to exceed ten Quarter hours of credit. Mr. Davis.

This course is designed to permit a properly qualified student to avail himself of the library and laboratory facilities of the department for adding to his knowledge and techniques in some subject in photography and for carrying out minor investigations.

PHYSICAL EDUCATION

MEN'S DIVISION

Office, 124 Physical Education Building

PROFESSORS ST. JOHN, OBERTEUFFER, AND BROWN, ASSOCIATE PROFESSORS ASHBROOK, DUFFEE, STALEY, HOWARD, AND LARKINS

WOMEN'S DIVISION

Office, 201 Pomerene Hall

PROFESSOR PALMER, ASSOCIATE PROFESSOR D. WIRTHWEIN, ASSISTANT PROFESSORS GILMAN, STEIN, AND WATSON

Prerequisites for Graduate Work: Unconditional admission to graduate work in physical education is based on presentation of credit from accredited institutions as follows: at least fifteen Quarter hours in professional education; at least nine Quarter hours in either human anatomy or physiology or both; and at least twenty-four Quarter hours in physical and health education. These twenty-four Quarter hours (sixteen semester hours) must correspond with the Ohio teaching minor in physical and health education as established by the Ohio Department of Education. Candidates in health education only must possess the equivalent of the requirements listed by the University as the health education teaching field.

In cases where deficiencies in previous training are found, all or part of these prerequisites will be assigned and work toward their removel must be taken in addition to the general graduate degree requirements.

Undergraduate credentials must be submitted to one of the graduate advisers of the Department of Physical Education for appraisal.

Requirements for the Ph.D. Degree: Candidates for the Ph.D. degree must, in addition to fulfilling the requirements of the Graduate School, elect twenty hours of work in one field related to physical and health education chosen in conference with the committee assigned to the student.

Matters pertaining to the administration of the graduate program in physical and health education should be referred to the chairman of graduate courses in the department.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

†601. **Principles of Football Coaching and Management (Men).** Three credit hours. General prerequisites must include coaching experience. Mr. Brown.

A course for advanced students of football. The course will consider the principles underlying various types of football strategy, the designing of plays, methods of teaching and controlling players; also, special problems of management, such as those connected with selecting, handling equipment, and making trips.

Given in the Summer of 1943.

615. **Problems in Intramural Sports (Men and Women).** Two credit hours. Spring Quarter. Two class meetings each week. Mr. Staley.

A critical analysis of intramural sports programs with a view to their justification from the standpoint of objectives, age level and contribution to the general welfare of the students participating. Problems of policy and administration of programs on the elementary, secondary and college levels will be studied. Lectures, readings, reports, and discussions.

Given in the Summer of 1943.

621. **Principles of Physical Education (Men and Women).** Five credit hours. Winter Quarter. General prerequisites must include ten hours of physical education or equivalent biological training and courses in the theory and practice of physical education, or equivalent. Mr. Oberteuffer.

The nature of physical education, especially in relation to overlapping fields, such as health education and community recreation, and to education in general. A critical analysis of various objectives advanced; a review, with applications to physical education of modern conceptions of education and of modern principles in psychology and physiology.

Given in the Summer of 1943.

625. **Evaluation in Physical Education (Men and Women).** Three credit hours. Winter Quarter. Two lectures and one two-hour laboratory period each week. Mr. Ashbrook.

A critical study of ways and means of evaluating biological, social and psychological

† Not given during the academic year, 1943-1944.

outcomes of programs of physical education. Analyses of various specific tests and standards in use in schools will be made.

Given in the Summer of 1943.

630. Individual Physical Education (Men and Women). Three credit hours. Autumn Quarter. Three lectures each week. General prerequisites must include an elementary course in individual physical education. Section for men, Mr. Howard; section for women, Miss Gilman.

Making a physical education program meet the needs of handicapped individuals, fundamental principles in the selection and adaptation of activities in corrective procedures, abnormal physical conditions that come to the care or attention of the physical educator, methods of examining and determining individual needs, activity programs of both formal and informal character to meet the needs in schools and colleges, will be the problems dealt with in this course. The problems will be discussed in the light of modern objectives of education and particularly individual physical education. There will be lectures, recitations, demonstrations, term projects, and occasional trips to various orthopedic hospitals for observation purposes.

631. Dance Composition (Men and Women). Three to five credit hours. Winter Quarter. General prerequisites must include a course in elementary interpretative dancing. Permission of instructor must be obtained. Miss Watson.

Lectures, readings, and discussions of the dance as an art. The study of body movement as an expressive medium based upon analysis of old and new dance forms. Practice in program-making and opportunity to assist in recital production.

632. Rhythmic Analysis (Men and Women). Three credit hours. Spring Quarter. Two lectures and three laboratory meetings each week. General prerequisites must include one Quarter of advanced dancing, elementary rhythmic analysis, elementary interpretative dancing, or the equivalent. Miss Watson.

A study of the rhythmic pattern of body movement in more complex dance forms; the kinesthetic theory of rhythmic perception, and the development of a discriminating sense of rhythmic values as carried into individual and group composition.

635. Current Problems in Physical Education for Girls and Women (Men and Women). Three credit hours. Autumn Quarter. Three lectures each week. General prerequisites must include Physical Education 621 or the equivalent and permission of the instructor. Miss Palmer.

A discussion of outstanding problems in the organization of physical education programs for girls and women: policies, activities, types of competition, point systems, awards, and athletic associations.

Given in the Summer of 1943.

641. Personal Health Problems (Men and Women). Three credit hours. Autumn Quarter. Three lectures and recitations each week. Mr. Oberteuffer.

A study of the problems of living as they involve the health of the adult. Problems of the adjustment of the individual to conditions of rural and urban life. An informational and problems course. Serves also as a basic subject matter course for advanced study in health education.

Given in the Summer of 1943.

643. Principles of Health Education (Men and Women). Three credit hours. Spring Quarter. Three lectures each week. Mr. Oberteuffer.

A basic survey of educational opportunities in health found in the various aspects of school life. Principles underlying the school health program. Survey of available teaching materials used in the classroom. Includes a study of official and non-official health agencies and their bearing upon the school health program. No discussion of the techniques of teaching.

Given in the Summer of 1943.

644. The Teaching of Health in Secondary Schools and Colleges (Men and Women). Three credit hours. Autumn Quarter. Three lectures each week. General prerequisites must include Physical Education 643 or the equivalent. Mr. Oberteuffer.

How to teach and what to offer in hygiene or health classes. Discussions of the methods and subject matter used in presenting hygiene to students. Includes a study of the opportunities for integration of health material with other subjects of the organized curriculum.

Given in the Summer of 1943.

645. Administrative Interrelationships of School Health Education (Men and Women). Three credit hours. Winter Quarter. Three class meetings each week. General prerequisites must include Physical Education 643. Miss Palmer.

This course proposes to continue the orientation of the student in matters of health education, with particular reference to public and organizational relationships. Problems of community preschool care, the follow-up work, community problems of programs for tuberculous children, crippled children, mental hygiene services. The relationships between the school personnel and medical, clinical, and nursing services in the community.

***646. Professional Preparation of Teachers in Physical and Health Education (Men and Women).** Three credit hours. Autumn Quarter. Three class meetings each week. Permission of the instructor must be obtained.

The principles underlying the professional training of teachers in physical and health education; curriculum construction; selection of candidates; supervised teaching; staff personnel; problems pertaining to professional students.

647. The Teaching of Physical Education (Men and Women). Three credit hours. Section for Men, Winter Quarter; Section for Women, Spring Quarter. Two lectures and three laboratory periods each week. Physical Education 621 must be included in the general prerequisites or taken concurrently and satisfactory proficiency in physical education activities. Section for Men, Mr. Ashbrook. Section for Women, Miss Stein.

Lectures, discussions, demonstrations, and practice. Selection and organization of subject matter in different types of physical education classes. Techniques of instruction. Use of equipment. Modification of subject matter and procedure to meet varying school and community conditions.

Given in the Summer of 1943.

648. The Teaching of Physical Education (Men and Women). Three credit hours. Spring Quarter. Two lectures and three laboratory periods each week. Physical Education 621 must be included in the general prerequisites or taken concurrently and satisfactory proficiency in physical education activities. Mr. Ashbrook, Mr. Larkins.

A continuation of Physical Education 647.

***649. Camp Administration (Men and Women).** Three credit hours. Five lecture-laboratory periods each week. Lectures, readings, and field demonstrations. Prerequisite for social administration students, Sociology 645. Prerequisite for physical education and education students, ten hours of sociology, and courses in the theory and practice of physical education. Mr. Staley.

The organization and direction of camps, particularly summer camps for boys and girls. Special attention is given to the social and educational program for adolescents. Designed for those preparing for administrative positions. Consideration of budgets, equipment, camp sites, program personnel. Practical observations and demonstrations.

Not open to students who have credit for Social Administration 649.

Available for graduate credit only for students majoring in education, physical education, and social administration.

651. Minor Problems in Physical Education (Men and Women). One to four credit hours. Autumn, Winter, and Spring Quarters. Permission of the adviser must be obtained. The staff.

Investigation of minor problems in the field of physical and health education.

Given in the Summer of 1943.

682. Organization and Administration of Physical Education (Men and Women). Five credit hours. Winter Quarter. Five lectures each week. General prerequisites must include Physical Education 621 or equivalent. Section for men, Mr. Howard; Section for Women, Miss Palmer, Mrs. Wirthwein.

The policies in the organization and administration of the Physical Education program; classification of students, staff, teaching load, time schedule, finances, etc. The administration of the Physical Education plant; gymnasium, locker rooms, swimming pool, equipment, records. Intra-school relationships.

Given in the Summer of 1943.

* Not given in 1943-1944.

685. Prevention and Care of Injuries (Men). Three credit hours. Autumn Quarter. Three lectures each week. Mr. Duffee.

A consideration of the methods of prevention and care of injuries occurring in physical education and competitive sports. The course also includes a discussion of the conditioning of men for athletic contests.

691. Kinesiology (Men and Women). Three credit hours. Autumn Quarter. Four lecture-laboratory periods each week. General prerequisites must include acceptable courses in human anatomy and physiology. Section for men, Mr. Howard; section for women, Miss Stein.

The science of bodily movement. Basis for: prescription of activities in individual physical education; identification of common athletic injuries; form and style in athletic performance analysis of coordination in sports, gymnastics, and ordinary activities of daily life.

692. The School Health Service (Men and Women). Three credit hours. Winter Quarter. Three lectures each week. Mr. Duffee.

A consideration of the problems in connection with the health of the school child and teacher. Discussions and reports relating to medical inspection, physical examinations, symptoms and control of common school diseases, malnutrition, and the health environment of the school child. Observations in schools of physical examinations, systems of record keeping, follow-up services, malnutrition, and of the classes for the handicapped will be made.

NOTE: For course in the History of Physical and Health Education, see the Department of Education, Course 642.

For course in the Physiology of Exercise see the Department of Physiology, Course 640.

For course in the Administration of Physical and Health Education see the Department of Education, Course 731.

For course in Health Education for Teachers see the Department of Education, Course 664.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

801. Seminar in Health Education (Men and Women). Two credit hours. Autumn Quarter. The staff.

Discussion sections will be arranged for small groups according to school and institutional levels.

Given in the Summer of 1943.

802. Seminar in Physical Education (Men and Women). Two credit hours. Winter Quarter. The staff.

Given in the Summer of 1943.

803. Seminar in Athletics (Men and Women). Two credit hours. Spring Quarter. The staff.

Given in the Summer of 1943.

805. Physical Education in Schools and Colleges (Men and Women). Three credit hours. Autumn Quarter. Three lectures and discussions each week. General prerequisites must include Physical Education 621 or its equivalent. Mr. Oberteuffer.

An analysis of existing school and college programs considered in the light of acceptable practices in school administration. Will involve some case studies with summaries drawn in terms of principles. Arranged for students with teaching experience.

Given in the Summer of 1943.

810. Scientific Studies in Physical Education (Men and Women). Three credit hours. Autumn Quarter. Three lectures each week. Mr. Ashbrook.

A survey and evaluation of published reports of research in the field of physical education.

Given in the Summer of 1943.

816. Problems in Interscholastic and Intercollegiate Athletics (Men and Women). Three credit hours. Spring Quarter. Three lecture and recitation hours each week. Mr. Oberteuffer.

The relation of athletics to education; problems of athletic organization; eligibility; finance; current trends and developments in management and purpose; public relations.

Given in the Summer of 1943.

820. Problems in Physical and Health Education (Men and Women). Three credit hours in (a) or (b) and not more than a total of six credit hours in the course as a whole. Winter Quarter. Three lecture and recitation periods each week. Mr. Oberteuffer, Miss Gilman, Mr. Howard.

Advanced problems in the relation of physical and health education to health and public health. Students will work individually or in groups towards the solution of their chosen problem. Special investigation and experience in such areas as physiotherapy methods in the after care of infantile paralysis and other handicaps. Individual and group readings and form discussions.

(a) Health Education. Three credit hours. Mr. Oberteuffer.

(b) The Physically Handicapped. Three credit hours. Miss Gilman, Mr. Howard.

823. Organic Science as Applied to Physical Education and Health Education. Five credit hours. Winter Quarter. General prerequisites must include ten hours of physiology, ten hours of chemistry, and ten hours of biology or its equivalent. Mr. Ashbrook.

This elective course has been planned for graduate students who need a systematic review of the fundamental sciences underlying physical and health education. It consists of an intensive series of lectures and demonstrations in the laboratory, supplemented by extensive reading. The purpose of the course will be to develop the integration of the sciences—chemistry, biology, anatomy, physiology—to the fields of physical education and health education.

Given in the Summer of 1943.

826. Supervision of Physical and Health Education (Men and Women). Four credit hours. Autumn Quarter. Three lectures each week. Permission of the instructor is required. Mr. Ashbrook.

A study of the opportunities and problems of the supervisor in city, county, and state school systems; the relations of the supervisor to the superintendent and to the teacher; rating teachers; methods of assisting teachers. Separate units of the course will consider supervisors problem unique to the sexes.

950. Research in Physical and Health Education (Men and Women). Autumn, Winter, and Spring Quarters. The staff.

Given in the Summer of 1943.

NOTE: For course in Public Recreation: Its Organization and Administration see the Department of Social Administration, Course 855.

PHYSICS AND ASTRONOMY

PHYSICS

Office, 107 Mendenhall Laboratory

PROFESSORS ALPHEUS W. SMITH, BLAKE, LANDE, ALVA W. SMITH, AND THOMAS, ASSOCIATE PROFESSORS GREEN, POOL, NIELSEN, AND ZUMSTEIN, ASSISTANT PROFESSORS HEIL, KNAUSS, HESTHAL, SHORTLEY, AND SHAFFER, MR. MORE, MR. GAERTTNER

Prerequisites for Graduate Work: Graduate work in physics presupposes the satisfactory completion of forty-five Quarter hours of undergraduate work in physics and chemistry and forty Quarter hours in mathematics including integral and differential calculus and differental equations. Students specializing in physics should have some knowledge of both organic and physical chemistry. If these requirements are not met at the time of admission, any deficiencies must be made up in excess of the regular requirements for a degree. Only students with high standing in their undergraduate work in physics, chemistry and mathematics will be admitted to graduate work in physics.

Requirements for the Master's Degree: The program of work leading to the Master's degree is not rigidly fixed. It is always planned after a consideration of the needs and interests of the student. In all cases it must provide an adequate foundation for further advanced work. (a) Each Quarter, prior to registration, a candidate for the Master's degree must plan his program with a member of the departmental Committee on Graduate Study. (b) Not later than two

Quarters before the time at which the candidate expects to receive the Master's degree he must, after a conference with a member of the departmental Committee on Graduate Study, select the subject of his thesis and the instructor with whom he elects to work. (c) A reading knowledge of either French or German is highly desirable but not a fixed requirement.

Requirements for the Degree Doctor of Philosophy: The course of study to be pursued for the Doctor's degree is arranged for each student by the departmental Committee on Graduate Study after consultation with the student and his adviser. Work in other departments may be recommended according to the needs of the individual student. In all cases, proper consideration must be given to the mastery of the broad fundamental principles necessary for productive scholarship. (a) All candidates for the Doctor's degree in physics are required to complete Mathematics 721, 722, and 723, in excess of the work in mathematics offered for the Master's degree. Other courses in mathematics are highly desirable and in some cases indispensable. (b) A reading knowledge of both French and German is required and students are advised to meet this requirement as early as possible. (c) Not later than four Quarters before the student expects to receive the Ph.D. degree he must, after a conference with a member of the departmental Committee on Graduate Study, select the field of his dissertation and the instructor under whose direction he elects to work. (d) Before being admitted to candidacy for the Doctor's degree the applicant is required to pass a written examination on theoretical mechanics and its applications; physical optics and atomic physics; electromagnetic phenomena; kinetic and quantum theory of matter; and mathematical methods in physics. These written examination are followed by an oral examination as required by the Graduate School.

Colloquium and Journal Club: Reports on current topics in physics and related fields are presented by graduate students and instructors at weekly meetings of the Theoretical Colloquium, the Journal Club and seminars on special subjects. All graduate students are expected to attend the Journal Club regularly and to take part in these discussions.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

Unless otherwise indicated, the prerequisites for "600" courses are one year of calculus and one year of college physics.

608. Advanced Electricity. Four credit hours. Autumn Quarter. Four lectures and recitations each week. Mr. Alva Smith.

An introductory course in the mathematical theory of electricity and magnetism. The topics treated are electrostatic fields, magnetostatic fields, magnetic fields of steady currents, dielectric polarization, magnetization.

***609. Molecular Physics and Heat.** Four credit hours. Winter Quarter. Four lectures and recitations each week.

Introduction to the fundamental ideas of thermodynamics and statistical mechanics with an extended discussion of the kinetic theory of gases; equation of state of ideal and real gases; transfer phenomena; Brownian motion; classical and modern theories of specific heats; temperature radiation; thermal excitation of spectra.

610. Conduction of Electricity through Gases. Four credit hours. Winter Quarter. Four lectures and recitations each week. Mr. Heil.

An introductory course on the passage of electricity through gases and evacuated tubes, ionic velocities, photo-electricity, cathode rays and positive rays, radioactivity, elementary introduction to electron theory of matter, etc.

Given in the Summer of 1943.

612. Periodic and Transient Electric Currents. Four credit hours. Spring Quarter. Three lectures and recitations and one two-hour laboratory period each week. Mr. Alva Smith.

Transient and stationary states in electrical circuits containing impulsive or periodic electromotive forces treated by the methods of differential equations and vector analysis; periodic and aperiodic currents in single circuits with resistance, inductance and capacity in series or parallel; coupled circuits; resonance phenomena; damped oscillations; theory of alternating current bridge measurements; pulsating currents; Fourier's analysis of periodic non-sinusoidal wave forms; electromagnetic radiation.

615. Introduction to Nuclear Physics. Four credit hours. Winter Quarter. Given in alternate years. Mr. Pool.

Review of recent experimental methods and data on transmutation of the elements by bombardment with protons, deuterons, neutrons, and alpha rays; artificial radioactivity; detection of nuclear disintegration products. Simple experiments are performed with cloud chambers, geiger counters, ionization chambers and the cyclotron.

* Not given in 1943-1944.

616. Advanced Physical Laboratory. Three to twenty-four credit hours. All Quarters. Two three-hour laboratory periods each week. General prerequisites must include one year of college physics. Mr. Heil.

This course is intended to give the advanced student in science practice in precise physical measurements, involving the use of high grade mechanical, optical, electrical and thermal instruments.

The work undertaken will be elected from the following topics:

a. **Mechanics and Heat.** Exact measurements involving determinations of elasticities of solids, moments of inertia, torsional rigidity, torsional hysteresis, "g" by physcal pendulum, coefficients of viscosity, density of gases and vapors, hygrometry, specific heats, thermo-electromotive forces; determination of heats of combustion of fuels by means of high grade calorimeters, etc.

b. **Advanced Optical Measurements.** Exact determinations of indices of refraction by means of spectrometers, wave lengths by means of ruled gratings and interferometers, dispersion, polarization, absorption, analysis of spectra, etc.

c. **Advanced Electrical Measurements.** Exact measurements of currents, resistances, electromotive forces, magnetic permeability, capacity and inductance, transient phenomena involving the determination of time constants of circuits; fundamental alternating current measurements; the use of the oscillograph in the study of alternating and transient currents.

d. **Advanced Measurements in Ionization and Radioactivity.** Use of electrometers and electroscopes for exact mensurements of currents in gases, saturation currents, discharge of electricity and ionizing properties of radioactive materials, absorption of radiation; ionizing properties of flames and incandescent solids; characteristic curves of thermionic vacuum tubes and applications, photo-electricity, etc.

e. **Pyrometry and High Temperature Measurements.** Thermo-electric pyrometers, resistance thermometers, optical pyrometers, total radiation pyrometers, temperature recorders and controlling devices, transition points and thermal analysis at high temperatures.

f. **Acoustics.** Measurements of frequency, intensity and velocity of sound; comparison of wave forms; forced vibrations and resonance; acoustical dust figures; acuity of hearing; acoustical characteristics of rooms.

g. **Spectroscopy.** Study of characteristics and measurement of wave lengths of visible, ultra-violet and infra-red spectra.

Any one of the above topics may be selected during any Quarter with the exception of topic (d), which is offered only during the Winter Quarter.

A student may repeat this course until he has obtained a maximum of twenty-four credit hours. Only three credit hours may be taken during any Quarter except during the Summer Quarter, when six credit hours may be obtained. A student may accumulate not more than six credit hours in any *one* of the above topics.

Given in the Summer of 1943.

617. Physical Optics and Optical Instruments. Four credit hours. Autumn Quarter. Three lectures and recitations and one two-hour laboratory period each week. Given in alternate years. Mr. Zumstein.

An introductory course in physical optics covering the following topics: light sources; nature, propagation and velocity of light; optical phenomena such as refraction, reflection, interference, diffraction and polarization; absorption, scattering and dispersion of light; optical activity; fluorescence and phosphorescense; characteristics and uses of optical instruments.

618. Modern Atomic Spectroscopy. Four credit hours. Winter Quarter. Four lectures and recitations each week. Mr. Hesthal.

A discussion of the phenomena of line spectra of atoms, including interpretation of the hydrogen spectrum according to Bohr's orbit theory and in terms of the quantum mechanics; classification and explanation of line series; interpretation of multiplet structure in complex spectra by means of the vector model of the atom. Special topics discussed include allowed energy states and quantum numbers, selection rules for transitions, line intensities, neutral and ionized states, ionization potentials, Zeeman effect, Stark effect, forbidden transitions, isoelectronic sequences, etc.

619. Spectra and Structure of Molecules. Four credit hours. Spring Quarter. Four lectures and recitations each week. Given in alternate years. Mr. Nielsen.

Review of experimental methods and data on band spectra of molecules; empirical classification of spectra and correlation with molecular energy states; relation of energy expressions to molecular structure; selection rules and intensities of transitions; macroscopic properties of molecules obtained from Band spectra; applications to chemical problems.

Given in the Summer of 1943.

620. X-rays and Atomic Structure. Four credit hours. Autumn Quarter. Four lectures and recitations each week. Mr. Pool.

Production, measurement and effects of X-rays, including gamma rays; classical electron theory of the reflection, refraction, absorption and scattering of X-rays; quantum theory of the origin of X-ray spectra and structure of heavy atoms.

***621. Acoustics.** Four credit hours. Autumn Quarter. Four lectures and recitations each week. Given in alternate years.

A discussion of wave motion, forced vibrations, origin, propagation, velocity, interference, diffraction, resonance and energy relations of sound waves, vibration of strings and organ pipes, speech sounds, acoustics of buildings, etc.

622. Thermionics and High Vacuum Phenomena. Four credit hours. Spring Quarter. Four lectures and recitations each week. Mr. Heil.

Physical theory of thermionic emission; discharge from incandescent solids in gases and vacua; effect of space charge and electrode potentials on currents in vacuum tubes; production and measurement of high vacua; application of thermionic devices to rectification, production and detection of electrical oscillations; measurement of low pressures; excitation potentials.

623-624-625. Introduction to Theoretical Physics. Three credit hours each Quarter. Autumn, Winter, Spring. Three lectures and recitations each week. General prerequisites must include Mathematics 601 and 611 and three Quarters of college physics or their equivalents. Mr. Thomas.

This course is an introductory mathematical survey of the field of theoretical physics with emphasis on the application of mathematical methods to the solution of physical problems. The content of the course is selected from the following topics: dynamics of a particle, dynamics of rigid and deformable bodies, hydrodynamics of perfect and elastic fluids, dynamical theory of gases, electrostatics and electromagnetics, transient and alternating currents, electromagnetic waves along wires and in free space, elementary quantum mechanics.

626. Methods of Theoretical Physics. Three credit hours. Autumn Quarter. Three lectures and recitations each week. Mr. Shaffer.

An introductory course coordinating the methods of solving problems in such fields of classical physics as dynamics of particles and systems of particles, wave motion, electrodynamics, heat flow, etc. The course is especially adapted to needs of students in chemistry and engineering but is also open to students majoring in physics.

Given in the Summer of 1943.

627. Introduction to Chemical Physics. Three credit hours. Winter Quarter. Three lectures and recitations each week. Mr. Shaffer.

A course dealing with topics in modern physics which are of particular interest to chemists, including the electrical nature of matter, introductory quantum mechanics, discrete and continuous spectra of atoms and molecules, predissociation, nature of the chemical bond, quantum mechanical resonance, etc.

630. Minor Problems in Physics. One to fifteen credit hours. Any Quarter. Conference, library, and laboratory work. General prerequisites must include satisfactory advanced courses in general experimental and theoretical physics. All instructors.

This course is designed to permit any properly qualified student to avail himself of the library and laboratory facilities of the department for adding to his knowledge and techniques in some subject in physics, for repeating classical physical experiments, or for carrying out minor investigations. Among the topics on which experimental work can be arranged are the following:

(a) Acoustics
(b) Chromatic photometry
(c) Electrical and magnetic measurements at different frequencies
(d) High vacuum phenomena and techniques
(e) Photoelectricity and thermionics
(f) Pyrometry
(g) Radioactivity and atomic disintegration
(h) Visible, ultra-violet, and infra-red spectroscopy
(i) X-rays and crystal structure

Students who have specialized interest in some field of physics may elect this course to secure an opportunity for *independent reading and study* under the supervision of an instructor. The student will be permitted to choose the instructor and, subject to his approval, the field in which this reading is to be done.

Given in the Summer of 1943.

* Not given in 1943-1944.

*640. **Modern Physics.** Three credit hours. This course cannot be counted toward a major in physics. General prerequisites must include one year of college physics.

This course is intended primarily for teachers of physics, chemistry, and general science in the secondary schools. It presents in a simple, non-mathematical manner recent advances in physics, with numerous illustrations and applications. The subject matter is organized in a way to make it available for teachers in secondary schools.

*645. **Acoustics for Students of Music.** Three credit hours. This course cannot be counted toward a major in physics.

An elementary, non-mathematical treatment of acoustics with applications to music, including the following: production, amplification, propagation, and detection of sound waves; characteristics of tones; overtones; resonance; reverberation; localized echoes; phase effects; hearing; musical instruments; acoustical apparatus, etc.

647. **Physics of the Atmosphere.** Three credit hours. One Quarter. Autumn and Spring. Three class meetings each week. Mr. Alva Smith.

Application of principles of physics to such atmospheric processes as heating and cooling, motion of air masses, temperature variations, evaporation and condensation, radiation; electrical, optical and acoustical phenomena of the atmosphere.

654. **X-rays and Crystal Structure.** Four credit hours. Winter Quarter. Four lectures and recitations each week. General prerequisites must include calculus and one year of college physics. Given in alternate years. Mr. Blake, Mr. McCaughey, Mr. Harris.

This course is designed for those students of physics, chemistry, and mineralogy who intend to do research work in crystal structures and X-ray analysis.

This course is the same as Mineralogy 654 and Chemistry 654.

NOTE: TEACHING COURSES. For the Teaching Course in this department see the Department of Education, Course 684.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

A reading knowledge of German and French is highly desirable.

*801. **Electromagnetic Theory of Light.** Three credit hours. Spring Quarter. General prerequisites must include Physics 617 and 625 or their equivalents.

Resolving power of optical instruments. Maxwell's theory of light. Polarization, refraction, and absorption. Propagation of light in crystals. Electronic theory of dispersion. Electro- and magneto-optics.

803-804. **Thermodynamics.** Three credit hours. Autumn and Winter Quarters. General prerequisites must include Physics 609 and Mathematics 601 and 611 or their equivalents. Mr. Landé.

This course deals with the fundamental principles of thermo-dynamics and their application to such topics as osmotic pressure, electrolytic conduction, diluted and concentrated solutions, the phase rule, chemical equilibrium, metastability of matter, Nernst's heat theorem and the modern theories of specific heats.

*805-*806. **Electromagnetic Field Theory.** Three credit hours. Autumn and Winter Quarters. General prerequisites must include Physics 609 and Mathematics 601 and 611 or their equivalents.

Electro- and magneto-statics. Maxwell's theory of electrodynamics. Propagation of electromagnetic waves. Vibrations. Electro-magnetic phenomena in bodies at rest and in motion. Principle of relativity.

813. **Line Spectra and Atomic Structure.** Three credit hours. Spring Quarter. General prerequisites must include Physics 618 and 818 or their equivalents. Mr. Green.

Interpretation of spectral series, stationary states and term values, spinning electrons and fine line structure, vector models of atoms, Zeeman effect and Stark effect, intensity and polarization of spectral lines, Pauli's exclusion principle, hyperfine structure and nuclear moments.

* Not given in 1943-1944.

***815. X-rays and Quantum Theory of Atomic Structure.** Three credit hours. Spring Quarter. General prerequisites must include Physics 620 or its equivalent.

The Thomas-Fermi distribution of electrons in atoms and the Hartee distribution in relation to atomic scattering; the theory of coherent and incoherent scattering; the dimensions of atoms and molecules as determined by X-ray and electronic scattering; the fine line structure of emission lines and of absorption limits. The use of X-rays in the study of molecular structure.

817-818. Quantum Mechanics. Three credit hours. Autumn and Winter Quarters. General prerequisites must include Mathematics 601 and 611 or their equivalents and should include Physics 618 or 619. Mr. Landé.

Contrast between waves and particles. Uncertainty principle. Schrödinger's wave equation. Perturbation theory. Spectral lines of atoms and molecules. Compton and Raman effects. Molecular forces. Quantum statistics.

819. Advanced Quantum Mechanics. Three credit hours. Spring Quarter, General prerequisites must include Physics 818. Mr. Landé.

A topic such as the quantum theory of radiation, of solid bodies, or of atomic nuclei, will be discussed in detail. The topic for 1943-1944 will be announced as soon as possible.

***820. The Atomic Nucleus and Nuclear Transmutations.** Three credit hours. Winter Quarter. General prerequisites must include Physics 615 and 817 or their equivalents.

Nuclear mechanical moments, magnetic dipole moments and electric quadrupole moments are considered in their relations to nuclear transmutation probabilities. The statistics of nuclear particles and nuclear binding forces are discussed. Radioactive transformations, both natural and artificial, are studied. Alpha- beta- and gamma-ray spectra are interpreted in terms of nuclear energy level diagrams. Scattering problems involving electons, protons and neutrons are discussed.

***824. Statistical Mechanics.** Three credit hours. Autumn Quarter. General prerequisites must include Physics 609, 625, and 818, or their equivalents.

Statistical mechanics and its relation to thermodynamics and to quantum theory; classical, Fermi-Dirac, and Einstein-Bose statistics; statistical equilibrium and steady change. Applications to the specific heats of gases and crystals, vapor pressure, chemical equilibrium, imperfect gases, dissociation and ionization, thermionics, temperature radiation, fluctuation and Brownian movement, viscosity and conduction of heat and electricity.

†825. Applications of Statistical and Quantum Mechanics. Three credit hours. Spring Quarter. General prerequisites must include Physics 824 or permission of the instructor.

The application of quantum mechanics to a special problem such as the second quantization of fields; the theory of magnetism; the application of atomic theory in a special field such as astrophysics; the theory of the solid state. The topic for the year will be selected from the above list according to the interests of the students registered for the course.

Given in the Summer of 1943.

***851. Molecular Spectra I.** Three credit hours. Winter Quarter. General prerequisites must include introductory courses in spectroscopy and quantum mechanics. Given in alternate years.

Separation of the electronic, vibrational and rotational aspects of the spectra of molecules; derivation of quantum-mechanical Hamiltonian for vibrating and rotating molecules; discussion of wave functions, allowed energies and selection rules of harmonic oscillators and of symmetric and asymmetric rotators; interactions between oscillation and rotaton; origin and interpretation of rotation-vibration spectra.

***852. Molecular Spectra II.** Three credit hours. Spring Quarter. General prerequisites must include introductory courses in spectroscopy and quantum mechanics. Given in alternate years.

General theory of gyro-vibronic energy states of molecules; symmetry properties of various molecular configurations and group theory classification of energy states; origin and interpretation of electronic spectra of diatomic and polyatomic molecules; applications of data on molecular spectra to related chemical and physical phenomena. It is desirable but not necessary that Physics 851 be taken before this course.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

860-861-862. Mathematical Physics. Three credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include Physics 625 or its equivalent. Mr. Thomas.

Advanced mathematical methods and their application to various branches of theoretical physics such as: advanced Hamiltonian dynamics; advanced potential theory; mathematical theory of elasticity; theoretical hydro- and aero-dynamics; the principle of relativity in physics. The topic for a given Quarter will be selected from the above list according to the interests of the students registered for the course. The three Quarters will in general be independent and may be taken separately.

Physics 861 given in the Summer of 1943.

950. Research in Physics. Autumn, Winter, and Spring Quarters. Library, conference, and laboratory work. General prerequisites must include acceptable courses in physics and mathematics. The student may spend a part or all of his time on his chosen field of research. This course is intended primarily to meet the needs of students who must complete either a thesis or a dissertation as part of the requirements for a degree. Department staff.

Given in the Summer of 1943.

ASTRONOMY

Office, Emerson McMillin Observatory

PROFESSOR MANSON

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

605. Introduction to Celestial Mechanics. Four credit hours. Winter Quarter. Four lecture and recitation periods each week. General prerequisites must include one year of calculus and ten Quarter hours of astronomy or ten Quarter hours of physics. Given in alternate years. Mr. Manson.

A discussion of rectilinear motion under the law of inverse squares and the law of direct distance; potential and attraction; the problem of two bodies; the general integrals of the problem of 'n' bodies; the restricted problem of three bodies; introductory discussion of lunar theory.

*606. Orbits. Four credit hours. Winter Quarter. Four lecture and recitation periods each week. General prerequisites must include one year of calculus and ten Quarter hours of astronomy or ten Quarter hours of physics. Given in alternate years.

A discussion of the computation of positions of planets or comets in elliptical and parabolic orbits. The computation of orbits of planets and comets. Perturbations. Orbits of binary stars.

611. Minor Problems in Astronomy. Three to nine credit hours. Autumn, Winter, and Spring Quarters. Conference, library and laboratory work. General prerequisites must include a course in stellar astronomy or astronomy of the solar system. A student may repeat this course until he has earned a total of nine credit hours but not more than three credit hours may be taken in one Quarter. Mr. Manson.

This course is designed to permit properly qualified students to avail themselves of the facilities of the Observatory to work independently on a special problem in practical astronomy, to develop the necessary techniques for the successful use of astronomical instruments and to get some acquaintance with the methods of astronomical research. Each problem must be selected after consultation with the instructor in charge of the course.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Astronomy and Astrophysics at the Perkins Observatory. Autumn, Winter, and Spring Quarters. General prerequisites include acceptable courses in astronomy, mathematics, and physics. Subject of research must be chosen after consultation with the Director. The course may be re-

* Not given in 1943-1944.

peated as often as necessary in pursuit of any special research. (See page 12 for research facilities offered by the Perkins Observatory.)

Given in the Summer of 1943.

PHYSIOLOGICAL CHEMISTRY, PHARMACOLOGY, AND MATERIA MEDICA

Office, 108 Hamilton Hall

PROFESSOR SMITH, ASSOCIATE PROFESSOR BROWN, ASSISTANT PROFESSORS WIKOFF AND RUGGY, MR. ROSENFELD

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include fundamental courses in general chemistry, qualitative and quantitative analysis and organic chemistry.

Courses 601, 602, 609, 610, and 671 are open only to students doubly registered in the College of Medicine and the Graduate School. Courses 632 and 633 are open only to students doubly registered in the College of Dentistry and the Graduate School. (See page 30.)

Qualifying Examination for the Master's Degree: At least one Quarter prior to the Convocation at which he expects to receive the Master's degree the candidate must pass a written examination covering general inorganic chemistry, analytical chemistry, and the fundamentals of organic chemistry. He must also give evidence of his ability to read articles in his field written in the German or French language.

PHYSIOLOGICAL CHEMISTRY

601. Physiological Chemistry. Four credit hours. Autumn Quarter. Two lecture and two quiz hours each week. Physiological Chemistry 609 must be taken concurrently. Mr. Brown, Mr. Ruggy.

The chemistry of carbohydrates, lipids, and proteins.

Not available for graduate credit for students majoring in physiological chemistry.

602. Physiological Chemistry. Four credit hours. Winter Quarter. Two lectures and two quiz hours each week. General prerequisites must include Physiological Chemistry 601. Mr. Brown, Mr. Ruggy.

The chemistry of digestion, metabolism, and excretion.

Not available for graduate credit for students majoring in physiological chemistry.

Given in the Summer of 1943.

609-610. Physiological Chemistry Laboratory. Two credit hours. Autumn and Winter Quarters. Six laboratory hours each week. Physiological Chemistry 601 must be included as a prerequisite or must be taken concurrently. Mr. Ruggy.

Laboratory work demonstrating the properties of fats, carbohydrates and proteins during the Autumn Quarter. In the Winter Quarter experiments concerning the chemistry of digestion, metabolism and excretion together with a consideration of the chemistry of the tissues.

Physiological Chemistry 610 given in the Summer of 1943.

611. Physiological Chemistry. Five credit hours. Winter Quarter. Three lecture-quiz hours and six laboratory hours each week. General prerequisites must include quantitative analysis and Chemistry 647, 648, 649, 650. Miss Wikoff.

The chemistry of carbohydrates, lipids, and proteins.

Not open to students who have credit for Physiological Chemistry 601. Not available for graduate credit for students majoring in physiological chemistry.

612. **Physiological Chemistry.** Five credit hours. Spring Quarter. Three lecture-quiz hours and six laboratory hours each week. General prerequisites must include Physiological Chemistry 611. Miss Wikoff.

The chemistry of digestion, metabolism, and excretion.

Not open to students who have credit for Physiological Chemistry 602. Not available for graduate credit for students majoring in physiological chemistry.

Given in the Summer of 1943.

613. **Quantitative Method of Blood Analysis.** Three credit hours. Autumn Quarter. One lecture and six laboratory hours each week. General prerequisites must include Physiological Chemistry 602 or 612. Miss Wikoff.

Determination of important constituents of the blood.

614. **Biochemical Methods of Analysis (Food Analysis).** Five credit hours. Winter Quarter. Two hours of lecture or quiz and nine laboratory hours each week. General prerequisites must include Physiological Chemistry 611. Miss Wikoff.

The quantitative analysis of the proteins, fats, and carbohydrates. Special methods for the analysis of biological materials.

618. **Toxicology and Legal Medicine.** Two or four credit hours. Winter Quarter. Two lectures and six laboratory hours each week. For four credit hours, general prerequisites must include acceptable courses in quantitative analysis and organic chemistry. Mr. Smith.

A course dealing with that portion of medical knowledge which may be of assistance in serving the needs of law and justice including the effects and detection of poison.

Given in the Summer of 1943.

619. **Minor Problems in Physiological Chemistry.** Two to fifteen credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include Physiological Chemistry 614. A student may repeat this course and may spend all or part of his time on it during a Quarter. Mr. Smith, Mr. Brown, Miss Wikoff, Mr. Ruggy.

This course is designed to permit any properly qualified person to avail himself of the facilities of the department for carrying out a minor investigation or for adding to his knowledge and technique in physiological chemistry. A student may exercise complete freedom in his choice of instructor to direct his work in this course.

Given in the Summer of 1943.

632. **Physiological Chemistry.** Six credit hours. Spring Quarter. Four lecture or quiz hours and six laboratory hours each week. Mr. Brown.

The chemistry of the carbohydrates, lipids, and proteins; together with the chemistry of digestion, absorption, metabolism, and excretion; the tissues; the internal secretions.

633. **Physiological Chemistry.** Two credit hours. Autumn Quarter. One lecture and one quiz hour each week. General prerequisites must include Physiological Chemistry 632. Mr. Brown.

The elements of human nutrition; the effects of diets on the human body; the relation of diets to dentistry.

715. **Biochemical Biography.** One credit hour. Autumn Quarter. General prerequisites must include Physiological Chemistry 612. Required of all candidates for graduate degrees in physiological chemistry. Miss Wikoff.

PHARMACOLOGY

671. **Pharmacology.** Four credit hours. Spring Quarter. Three lecture or quiz hours and three laboratory hours each week. General prerequisites must include Physiology 635, 636 and Physiological Chemistry 602 or 612. Mr. Smith, Mr. Ruggy, Mr. Rosenfeld.

This course treats of the modification of the normal physiological processes of the body by the presence of the more common drugs used in medicine.

675. **Methods of Biologic Drug Assay.** Three credit hours. Spring Quarter. Two lectures and one three-hour laboratory period each week. General prerequisites must include fundamental courses in biology and chemistry in addition to permission of the instructor. Mr. Ruggy.

This course includes consideration of the methods in common use for the biological standardization of drugs.

Given in the Summer of 1943.

676. **Minor Problems in Materia Medica and Pharmacology.** Two to fifteen credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include acceptable courses in chemistry or pharmacology. A student may repeat this course and may spend all or part of his time on it during a Quarter. Mr. Smith, Miss Wikoff, Mr. Ruggy.

This course is designed to permit any properly qualified person to avail himself of the facilities of the department for carrying out a minor investigation or for adding to his knowledge and technique in materia medica or pharmacology. A student may exercise complete freedom in his choice of instructor to direct his work in this course.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

PHYSIOLOGICAL CHEMISTRY

*813. **Seminar in Physiological Chemistry.** Two credit hours. Spring Quarter. General prerequisites must include Physiological Chemistry 612. Mr. Smith.

821. **Advanced Physiological Chemistry.** Three credit hours. Winter Quarter. Three lectures each week. General prerequisites must include Physiological Chemistry 602 or 612, or Chemistry 841, 842, 843. Miss Wikoff.

A graduate course covering the carbohydrates, lipids, and proteins for students who wish to emphasize the chemical aspect of their training.

822. **Advanced Physiological Chemistry.** Three credit hours. Spring Quarter. Three lectures each week. General prerequisites must include Physiological Chemistry 602 or 612 or Chemistry 841, 842, 843. Mr. Brown.

An advanced course covering the chemistry of metabolism, tissues, hormones and vitamines.

825-826. Advanced Physiological Chemistry Laboratory. Three credit hours. Winter and Spring Quarters. Nine hours of library, conference and laboratory work each week. Physiological Chemistry 821 and 822 must be included in the general prerequisites or taken concurrently. Mr. Ruggy.

Advanced courses in biological preparation including the isolation of enzymes, carbohydrates lipins, proteins and such hormones as epinephrin and insulin.

830. **Chemistry of Medicinal Substances.** Three credit hours. Winter Quarter. Three conference hours each week. General prerequisites must include Physiological Chemistry 611, 612, or Chemistry 841 and 842. Mr. Smith.

PHARMACOLOGY

850. **Experimental Pharmacodynamics.** Five credit hours. Autumn Quarter. Three conference or lecture hours and six laboratory hours each week. General prerequisites must include acceptable courses in physiology and chemistry including Physiological Chemistry 602 or 612. Mr. Smith, Mr. Ruggy.

This course deals with the actions of drugs on the normal physiological processes, apart from therapeutics, and with some of the theories which seek to explain these actions.

RESEARCH

950. **Research in Physiological Chemistry and Pharmacology.** Autumn, Winter, and Spring Quarters. Research in Physiological Chemistry will be con-

* Not given in 1943-1944.

ducted under the guidance of Mr. Smith, Mr. Brown, Miss Wikoff, Mr. Ruggy; research in Materia Medica under the guidance of Mr. Smith, Miss Wikoff.

Given in the Summer of 1943.

PHYSIOLOGY

Office, 204 Hamilton Hall

PROFESSORS HARTMAN AND SEYMOUR, ASSOCIATE PROFESSORS EDWIN P. DURRANT (EMERITUS), HITCHCOCK, AND BOZLER, ASSISTANT PROFESSORS R. R. DURANT, AND RING, MR. SHELDEN

Prerequisites for graduate students majoring in physiology are the following courses or their equivalents: Courses in elementary chemistry and Chemistry 647, 648, 649, and 650 or equivalent; Courses in elementary zoology. Courses in general physics are desirable.

Requirements for the Master's Degree: (a) The candidate must give evidence of ability to read either scientific French or German. (b) He must pass an oral examination in the general field of physiology at least one Quarter before his final examination. See General Requirements in regard to thesis and final examination (pages 34 and 35).

Requirements for the Degree of Doctor of Philosophy: See General Requirements (page 41).

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. Advanced Physiology. Seven credit hours. Winter Quarter. Five lectures and six laboratory hours each week. General prerequisites must include two Quarters of chemistry and three Quarters of biology. Permission of the department chairman must be obtained. Department staff.

This course deals with cardiovascular system, body fluids, excretion, respiration, and digestion.

602. Advanced Physiology. Eight credit hours. Spring Quarter. Five lectures, one conference, and six laboratory hours each week. General prerequisites must include Physiology 601 or 615. Department staff.

Metabolism, endocrine system, neuromuscular system, central nervous system, and sense organs.

Given in the Summer of 1943.

604. Advanced Physiology. Five credit hours. Winter Quarter. Three lecture or recitation hours and six laboratory hours each week. Open only to students registered in the College of Dentistry. Mr. Hitchcock and staff.

The course deals with the body fluids, cardiovascular system, respiration, digestion, excretion, and neuromuscular system.

605. Anvanced Physiology. Seven credit hours. Spring Quarter. Five lecture or recitation hours and six laboratory hours each week. Open only to students registered in the College of Dentistry. Mr. Hitchcock and staff.

A continuation of Physiology 604 dealing with metabolism, nutrition, endocrines, reproduction, and sense organs.

Given in the Summer of 1943.

*625. Advanced Mammalian Physiology. Five credit hours. Winter Quarter. Two lectures and three three-hour laboratory periods each week. General prerequisites must include Physiology 626, 627, 628 or equivalent. Department staff.

An advanced course in the physiology of the mammal, based largely on laboratory experiments.

*626. Comparative Physiology. Five credit hours. Autumn Quarter. Four lecture hours and three laboratory hours each week. General prerequisites must include two Quarters of Chemistry and three Quarters of biological sciences. Mr. Angerer and staff.

General properties of cells (including contractility and irritability), the body fluids, the circulation, and the kidney in different animal types.

* Not given in 1943-1944.

*627. Comparative Physiology. Five credit hours. Winter Quarter. Four lecture hours and three laboratory hours each week. General prerequisites must include Physiology 626. Mr. Shelden and staff.

Metabolism, respiration, digestion, secretion, and excretion in different animal types.

*628. Comparative Physiology. Five credit hours. Spring Quarter. Four lecture hours and three laboratory hours each week. General prerequisites must include Physiology 627. Mr. Bozler and staff.

Hormones, nervous system and sense organs in different animal types.

629. Endocrinology and Metabolism. Five credit hours. Spring Quarter. Four lectures or recitations and one three-hour laboratory period each week. General prerequisites must include two Quarters of physiology or equivalent biological sciences. Department staff.

A survey of animal metabolism and of the endocrine system with emphasis on their interrelationships.

630. Advanced Physiology of the Endocrine System. Five credit hours. Spring Quarter. Four lectures and three laboratory hours each week. General prerequisites must include Physiology 626, 627, and 628, or equivalent. Department staff.

A study of the functions of the thyroid, parathyroid, pituitary, adrenal, pancreas, gonads, and other organs with possible endocrine function.

635. Advanced Physiology. Seven credit hours. Winter Quarter. Five lectures and six laboratory hours each week. Open only to students registered in the College of Medicine. Mr. Ring and staff.

Cardiovascular system, body fluids, excretion, respiration, and digestion.

636. Advanced Physiology. Eight credit hours. Spring Quarter. Five lectures, one conference, and six laboratory hours each week. Open only to students registered in the College of Medicine. General prerequisites must include Physiology 635. Mr. Ring and staff.

Metabolism, endocrine system, neuromuscular system, central nervous system and sense organs.

Given in the Summer of 1943.

640. Physiology. Five credit hours. Autumn Quarter. Three lectures and four laboratory hours each week. Mr. Durant and staff.

A course in the neuromuscular and integrative systems with particular reference to exercise.

700. Minor Problems. Three to fifteen credit hours. Autumn, Winter, and Spring Quarters. Designed for qualified students who wish to begin research. Permission of department chairman required. Department staff.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

815-816-817. Seminar in Physiology. Two credit hours. Autumn, Winter, and Spring Quarters. Required of all students majoring in physiology. Department staff.

950. Research in Physiology. Autumn, Winter, and Spring Quarters. General prerequisites must include Physiology 601 and 602 or equivalent courses and the permission of the department chairman.

The department is equipped to supervise research in circulation, endocrinology, metabolism, and muscle physiology.

Given in the Summer of 1943.

POLITICAL ECONOMY

(See Economics and Sociology)

* Not given in 1943-1944.

POLITICAL SCIENCE

Office, 100 University Hall

PROFESSORS SPENCER, WALKER, HELMS, AND AUMANN, ASSISTANT PROFESSORS FOSTER, BALLIS, AND WATKINS

Departmental Committee on Graduate Work: General supervision of all phases of the graduate program (including curriculum and the acceptance and retention of students) is exercised by a graduate committee of the Department. Each candidate for graduate work in political science or public administration shall submit to this graduate committee a statement of educational background, interests and aims. The graduate committee also requires progress reports at regular intervals concerning each such student.

Each graduate student enrolled in political science or public administration is placed under the immediate supervision of an advisory committee of three or more persons representing the departments in which the student is taking a substantial amount of work, at least two of whom are members of the department of political science. Each advisory committee is named by the graduate committee (which designates one of the number as chairman); and reports periodically to the graduate committee on the progress of the student. The student shall consult each member of his advisory committee at intervals concerning his program of study and in the preparation of his thesis or dissertation. In the case of the Master's degree, final approval of the thesis rests with the advisory committee whose members normally constitute also the oral examining committee.

Requirements for the Degree Doctor of Philosophy:

A. The fields of concentration in the Department of Political Science shall be recognized as follows:

I. Theory: 621, 622, 623 (611, 615, 626, 631)

II. International Law and Relations: 612, 613, 649, 625, 650 (631, 648)

III. Politics: 626, 633, 634, 635 (631, 625, 650)

IV. Administration: 605, 606, 607 (610, 615, 631)

V. Public Law: 616 and 611, or 615 or 617

NOTE I. In the above lists the courses included in the parentheses shall be considered desirable but not required of each candidate who is specializing in that field.

NOTE II. The minimum offering in each of the fields not selected for concentration should be as follows:

I. Theory: 621, 622, 623

II. International Law and Relations: 612, 613

III. Politics: 633, 634, 635

IV. Administration: 605, 606, 607

V. Public Law: 616 and 611, or 615 or 617

B. It is recommended that persons who are specializing in any field normally be required to complete all of the courses listed in that field.

C. At the preliminary examination the candidate should present himself for written and oral examination in the four fields other than his field of concentration.

D. The examination will cover a field as a whole rather than particular courses although a detailed examination will not be given in those optional portions of a field in which the candidate has had no course work.

E. Considerable flexibility will be permitted in arranging programs and encouragement should be given to the practice of including courses in other departments as a part of the preparation of the Ph.D. candidate with groups of courses in other departments, such as history and economics. This may be recognized as a fifth field to be presented at the time of the preliminary examination.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

600. Introduction to Political Science. Three credit hours. Winter Quarter. Three meetings each week. Not open to students with credit in political science. Mr. Foster.

An acquaintance with the most significant aspects of American national, state, and local government, including: political parties, elections, legislation, civil service, and courts; the parliamentary and authoritarian governments of Europe; international government. Lectures, readings, and discussions.

Not open to students majoring in political science.

605. Principles of Public Administration I. Five credit hours. Winter Quarter. Five meetings each week. General prerequisites must include ten hours in political science. Mr. Walker.

A consideration of the general problems of public administration; relations between the administration and the other branches of government—executive, legislative, and judicial; the civil service; personnel administration; budgets and accounting; centralized purchasing.

606. Principles of Public Administration II. Five credit hours. Spring Quarter. Five meetings each week. General prerequisites must include fifteen hours in political science. Mr. Walker.

An examination of the principles of public administration as applied to the rendering of service to the public by national, state and local governments. Attention will be paid to such functions as the protection of life and property, the promotion of trade and commerce, the regulation and operation of public utilities, city and metropolitan planning, and the furtherance of public welfare, noting in each case the part which is played by each of the levels of government.

607. Municipal Government. Five credit hours. One Quarter. Winter and Spring. Five meetings each week. Mr. Helms.

A comparative study of modern municipalities in the United States and the principal countries of Europe; their social significance; their governmental structure; their relation to the state; the experience with government by council, mayor, commission, and manager; methods of popular participation.

610. Problems of County and Rural Government. Two credit hours. Spring Quarter. Two meetings each week. General prerequisites must include ten hours in political science. Mr. Walker.

A study of structure and function of county government under both rural and urban conditions and an examination of problems of rural government.

***611. Introduction to Jurisprudence.** Five credit hours. Autumn Quarter. Five meetings each week. Alternating with Political Science 626. Mr. Spencer.

An introductory study of legal concepts. An attempt is made both to give the prospective law student an analytical and historical guide into his subject, and to give those who do not intend to pursue the study of law an idea of its significance in social organization, and its relation to political and economic science.

612. International Law. Three credit hours. Winter Quarter. Three meetings each week. Mr. Spencer.

A study of the principles of international law in their growth and present status, with particular attention to unsettled points, and problems raised by the World War and recent developments.

613. Contemporary International Politics. Five credit hours. One Quarter. Autumn, Winter, Spring. Five meetings each week. Mr. Spencer, Mr. Helms.

Methods and ideals of diplomacy; current problems in international relations, such as the reorganization of Europe, Pan-Americanism, and the Far East; tendencies toward administrative, judicial, and legislative world-organization.

Given in the Summer of 1943.

615. Administration of Justice. Three credit hours. Spring Quarter. Three meetings each week. Mr. Aumann.

A study of the nature, purposes, and limitations of law as administered through courts. The development, organization, and procedure of our judicial system. Recent trends in legal thinking.

616. American Constitutional Law. Five credit hours. Winter Quarter. Five meetings each week. Mr. Aumann.

A study of leading constitutional principles in the United States as interpreted by the courts. Special studies will be made of such topics as the following: the adoption and amendment of constitutions; the judicial power; citizenship; private rights; the powers of Congress; war powers; police power of the states; political privileges. Designed for students who desire a non-technical knowledge of the more important federal and state constitutional principles in the United States.

617. Administrative Law. Three credit hours. Spring Quarter. Three meetings each week. General prerequisites must include Political Science 616. Mr. Walker.

Administrative organization; procedure of administrative bodies; limits of administrative

* Not given in 1943-1944.

discretion; quasi-judicial and quasi-legislative powers of administrative bodies; relief against administrative action; conclusiveness of administrative findings. Cases and readings.

621. Ancient and Medieval Political Thought. Three credit hours. Autumn Quarter. Three meetings each week. Mr. Spencer.

The chief theories of European government from the time of Plato to the opening of the modern period. Political Science 621, 622, and 623 are intended to present consecutively the development of European political philosophy.

622. Modern Political Thought. Three credit hours. Winter Quarter. Three meetings each week. Mr. Spencer.

The chief theories of European and American government from the sixteenth century to the middle of the nineteenth century. This course is naturally preceded by Political Science 621, though the latter is not required, and is naturally followed by Political Science 623.

623. Contemporary Political Thought. Three credit hours. Spring Quarter. Three meetings each week. Mr. Spencer.

An examination of the more important contemporary trends of political thought and of the theoretical problems of the nature of the state, of government, and of law.

Given in the Summer of 1943.

625. The British Commonwealth. Three credit hours. Spring Quarter. Three meetings each week. General prerequisites must include elementary courses in political science. Mr. Heimberger.

A critical examination of the governments of the various units of the British Empire and the British Commonwealth of Nations with special attention to the self-governing dominions and India. A study of the interrelationships among the members of the commonwealth.

626. Dictatorship and Absolutism. Three credit hours. Autumn Quarter. Three class meetings each week. Alternating with Political Science 611. General prerequisites must include ten hours in political science. Mr. Spencer.

An examination of certain governmental systems of today which are based on rejection of the ideal of democracy. Special attention given to Russia, Italy, and Germany, but consideration also of minor instances. Political and social causes of this contemporary tendency; administrative and constitutional problems.

***631. Methods of Governmental Research.** Three credit hours. Autumn Quarter. Three meetings each week. Given in alternate years. General prerequisites must include fifteen hours of political science. Mr. Walker.

The materials of political science; history of procedure in political science research; research technique; presentation of results of research.

633. Legislation. Three credit hours. Autumn Quarter. Three meetings each week. Mr. Walker.

The process of law making in the United States, the constituent process, statute law making, legislative drafting, legislative procedure, judicial review, the common law, executive ordinances, popular law making.

634. Public Opinion and Political Processes. Five credit hours. Autumn Quarter. Five meetings each week. Mr. Foster.

Nature and measurement of public opinion and its effect on political processes; genesis of political attitudes; propaganda of pressure groups; government propaganda in peace and war; political influence of social institutions, including press, radio, and movies. Lectures, discussion, and report.

635. Elections and Parties. Five credit hours. Winter Quarter. Five meetings each week. Mr. Helms.

A study of voting qualifications, ballot forms, the direct-primary and other forms of nomination, systems of proportional representation, the organization and methods of political parties, and the position and functions of the party system in democracies.

648. The International Relations of the Far East (early times to 1895). Three credit hours. Autumn Quarter. General prerequisites must include elementary courses in political science. Mr. Watkins.

Early impact of the Occident upon the Far East; relations between Russia, Japan and China; the opening of the Far East in the nineteenth century; period of wars and unsettlement; international rivalries in China.

* Not given in 1943-1944.

649. The International Relations of the Far East (1895 to the present). Three credit hours. Winter Quarter. Mr. Watkins.

The Open Door policy; the Russo-Japanese War; the Chinese Revolution; the effects of the World War and the Russian Revolution; Japanese imperialism and the interests of the Soviet Union, Great Britain and the United States.

650. The Governments and Politics of the Far East. Five credit hours. Spring Quarter. Mr. Watkins.

The imperial system of China and the experiment with the Republic; constitutionalism vs. militarism in Japan; the contiguous governments of eastern Asia: Korea, Manchoukuo, Siberia, and Mongolia.

701. Minor Problems. Three to five credit hours. Autumn, Winter, and Spring Quarters. Informal conferences, the intent being to allow full scope to the initiative of the student. General prerequisites must include forty hours of credit in the social sciences including fifteen hours in political science. All instructors.

A special topic is assigned to each student and results are tested by the requirement of theses and special examinations.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include a foundation laid in college courses in the historical and social sciences.

805. Political Thought. Three to five credit hours. Autumn, Winter, and Spring Quarters. Mr. Spencer.

Research in the history of political ideas and in the theoretical problems of contemporary politics.

Given in the Summer of 1943.

806. Comparative Government. Three to five credit hours. Autumn, Winter, and Spring Quarters. Mr. Spencer.

Research in the governments of foreign countries.

Given in the Summer of 1943.

807. Public Opinion and Political Parties. Three to five credit hours. Autumn, Winter, and Spring Quarters. Mr. Helms, Mr. Foster.

A systematic study of the informal phases of politics. Special attention will be given to individual projects dealing with pressure groups, political party organization and procedure, and other aspects of the governmental process.

Given in the Summer of 1943.

808. Public Administration. Three to five credit hours. Autumn, Winter, and Spring Quarters. Mr. Walker.

Research in staff and line activities of national, state, and local government.

809. Municipal Government. Three to five credit hours. Autumn, Winter, and Spring Quarters. Mr. Helms.

Reading and research in the municipal governments of the United States and Europe.

810. International Relations. Three to five credit hours. Autumn, Winter, and Spring Quarters. Mr. Spencer.

Research in international relations.

Given in the Summer of 1943.

811. Public Law. Three to five credit hours. Autumn, Winter and Spring Quarters. Mr. Aumann.

Readings and research in the field of public law including selected problems in the fields of constitutional law or judicial administration.

812. Legislation. Three to five credit hours. One Quarter. Autumn, Winter, Spring. Mr. Walker.

Research in the legislative process as exemplified by Congress, the state legislatures and city councils.

814. International Administration. Three to five credit hours. Spring Quarter. Mr. Foster.

A study of the administrative aspects of the process of international cooperation; unions; governing commissions; courts; the sections and technical organizations of the League of Nations; International Labor Organization.

815. Bases of Conflicts in the Contemporary Far East. Three to five credit hours. One Quarter. Autumn, Winter, Spring. Mr. Ballis.

Investigations of the psychological, social, economic and political bases of conflicts between Japan, China and the Soviet Union.

950. Research in Political Science. Autumn, Winter, and Spring Quarters. General prerequisites must include six Quarter-courses in political science.

This course presents an opportunity for advanced research in political science, in such portion of the field as may be agreed upon with the individual student. It is offered in every Quarter, and with any of the members of the department in residence.

Given in the Summer of 1943.

POULTRY HUSBANDRY

Poultry Administration Building

PROFESSOR DAKAN, ASSOCIATE PROFESSOR WINTER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

***601. Poultry Nutrition.** Three credit hours. Autumn Quarter. One lecture and two two-hour laboratory periods each week. Mr. Winter.

Experimental techniques for determining the nutritive requirements of poultry. Biological analysis of feedstuffs for poultry.

603. Marketing Poultry Products. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include ten hours of economics, Rural Economics 613, or Business Organization 700. Mr. Dakan.

Market movements of poultry and eggs, marketing agencies, including poultry cooperatives, trends in refrigeration and preservation of poultry and eggs, and imports and exports of poultry products.

***606. Poultry Genetics.** Three credit hours. Winter Quarter. Three lecture-conference periods each week. General prerequisites must include a course in heredity. Mr. Dakan.

Inheritance of viability, egg production, and other characters of economic importance, breeding records, and progeny testing.

Not open to students who have credit for Poultry Husbandry 502.

610. Hatchery Management. Three credit hours. Autumn Quarter. Three lecture-conference periods each week. General prerequisites must include ten hours of economics. Mr. Dakan.

Egg supply, hatchery records and accounts, and the sale of chicks.

†615. Poultry Plant Management. Five credit hours. Spring Quarter. Five lecture-conference periods each week. General prerequisites must include ten hours of economics. Mr. Dakan.

Economic and management factors involved in the operation of specialized poultry breeding, egg, and meat plants.

Given in the Summer of 1943.

701. Special Problems in Poultry Husbandry. Three to fifteen credit hours, taken in units of three to five hours each Quarter for one or more Quarters. Autumn, Winter, Spring. Mr. Dakan, Mr. Winter.

Limited to advanced students and must be arranged with the instructor in charge. Each student will be required to make an exhaustive study of some particular phase of poultry hus-

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

bandry and write a thesis of his study and research. The work must comprise in part some original investigation by the student.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION" page 45.

950. Research in Poultry Husbandry. Autumn, Winter, and Spring Quarters. Library, conference, and laboratory work. General prerequisites must include acceptable courses in the chosen field of research. The student may spend a part or all of his time on research work. Mr. Dakan, Mr. Winter.

Research may be done in genetics, embryology, metabolism, and nutritional diseases.

Given in the Summer of 1943.

PRACTICAL ARTS AND VOCATIONAL EDUCATION

(See Education)

PRINCIPLES AND PRACTICE OF EDUCATION

(See Education)

PSYCHOLOGY

Office, 325 Arps Hall

PROFESSORS BURTT, GODDARD (EMERITUS), MAXFIELD, PRESSEY, TOOPS, DOCKERAY, RENSHAW, ENGLISH, WILLIAMS, BERRY, AND CARL R. ROGERS, ASSOCIATE PROFESSORS A. SOPHIE ROGERS, ROBINSON, EDGERTON, AND DUREA, ASSISTANT PROFESSORS STOGDILL, BAKER, BOWMAN, AND DOTY, DEAN GAW

The department offers instructional and training facilities in practically all divisions of psychology. For administrative purposes and general guidance of the student, these may be grouped into a number of areas mentioned below, but there is considerable flexibility in the working out of a unified program of study. This should be done in consultation with the adviser as early in the graduate program as possible. A student pursuing work beyond the Master's degree will have an advisory committee of three members which works closely with the student in planning his program. This committee reports annually to the Chairman of the Department as to the student's program and also certifies to the standing committee on examinations when they believe the student is ready for the general examinations and the fields in which he is to be examined.

Students seeking admission to graduate work in the Department of Psychology who have had less than twenty Quarter hours credit in psychology must have the admission approved by the chairman of the department and the proposed major adviser.

For purposes of the general comprehensive examination required for candidates for the doctorate, the work of the department may be considered under six areas or fields of specialization:

1. General Psychology (including theoretical, experimental and comparative)
2. Educational Psychology (including mental and educational tests)
3. Clinical and Abnormal Psychology
4. Statistics
5. Industrial Psychology
6. Personnel (academic)

The first portion of the general examination for admission to candidacy is administered by a standing committee of the department. In addition to the foregoing areas of the department, a seventh possibility is an examination in a related field outside the department. The candidate, subject to the approval of his advisory committee, selects four of these seven areas on which to be examined and one of these areas must be number 1 (supra) General Psychology. These four examinations will be written. If successful, the candidate then has a written examination of his field of specialization and the oral examination.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. Experimental Psychology. Three to five credit hours. Autumn Quarter. One lecture and two or more laboratory periods each week. Mr. Renshaw.

The laboratory training course in experimental psychology for advanced undergraduates and graduate students. The experiments are selected both for general cultural value and for preparation for technical research in experimental psychology.

Psychology 601, 602, 603 comprise a unit year's work. Students may enter any Quarter.

602. Experimental Psychology. Three to five credit hours. Winter Quarter. One lecture and two or more laboratory periods each week. Mr. Renshaw.

603. Experimental Psychology. Three to five credit hours. Spring Quarter. One lecture and two or more laboratory periods each week. Mr. Renshaw.

605. Physiological Psychology. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Dockeray.

A study of the physiological basis of psychological phenomena. The sensory processes, set, learning and inhibition will be special topics for treatment.

606. Advanced Physiological Psychology. Three credit hours. Winter Quarter. Three lectures each week. General prerequisites must include Psychology 605 or permission of the instructor must be obtained. Mr. Dockeray.

The physiological processes involved in attention, emotion, fatigue and sleep. Recent studies of muscle potentials and brain waves as they relate to psychological problems will be emphasized.

607. Genetic Psychology. Five credit hours. Spring Quarter. Five lecture hours each week. Lectures, recitations, and reports. Mr. Williams.

This course is designed to present the facts of mental development and their significance. Topics considered are: individual development, particularly with reference to the development of the nervous system; inheritance of mental traits; innate tendencies, their characteristics, description, and modification; play; mental states, their physiological basis and development with growth and training; moral and religious development; physical development.

Given in the Summer of 1943.

608. Educational Statistics: Elementary. Four credit hours. Autumn Quarter. Two lectures and two two-hour laboratory periods each week. Mr. Toops, Mr. Edgerton.

A basic statistical course for students intending to conduct major or minor research. Frequency distributions, measures of central tendency and variability; construction of graphs and charts; interpretation of results in terms of probability; simple treatment of correlation. Extended practice in the use of calculating machines and computational devices.

Given in the Summer of 1943.

609. Exceptional Children: General Survey. Three credit hours. One Quarter. Autumn and Spring. Three lecture hours each week. Lectures, reports, clinics, and visits to public institutions. General prerequisites must include ten hours of psychology. Mr. Maxfield, Mr. Berry.

The social and pedagogical significance of individual differences among children with respect to mental, physical, and social traits and their interrelations. Superior and subnormal children, those with special abilities and disabilities, the blind, the deaf and hard of hearing, the defective in speech, and those who present personality and behavior problems.

Given in the Summer of 1943.

610. Adolescence. Three credit hours. One Quarter. Autumn and Winter. Three lectures each week. Mr. English, Mr. Pressey, Mr. Robinson.

A study of the outstanding characteristics of the adolescent boy and girl, the educational and social problems arising at this period, and means for dealing with these problems.

Given in the Summer of 1943.

611. Mentally Deficient Children. Three credit hours. Winter Quarter. Three lecture hours each week. Lectures, reports, clinics, and visits to public institutions. General prerequisites must include thirteen hours of psychology. If this does not include Psychology 609, permission of the instructor must be obtained. Mr. Maxfield.

The varieties and grades of mental deficiency, including the backward child of the schools

and the distinctly feeble-minded. Consideration of mental deficiency and defect for purposes of educational treatment and social adjustment. The psychology of feeble-mindedness; types, degrees, causes, and consequences.

613. Mental and Educational Tests. Three credit hours. Winter Quarter. Two lectures and one conference and laboratory hour each week. Lectures, readings, classroom demonstrations, and special reports. Mr. Pressey, Mr. Doty.

A broad basic course for teachers and students of psychology, clinical work, and sociology. The course will begin with a discussion of tests in school subjects, will then take up tests of general and special ability and "non-intellectual" traits, and will conclude with a general discussion of the construction of tests and their use in dealing with various practical and research problems.

Given in the Summer of 1943.

***615. Psycho-Educational Diagnosis and Treatment.** Three credit hours. Autumn Quarter. One lecture and four laboratory hours each week. General prerequisites must include Psychology 613 or permission of the instructor must be obtained. Mr. Robinson.

Practice in the giving and scoring of tests. Clinical use of test materials in the diagnosis of special disabilities and difficulties in school work; clinical practice with remedial procedures.

616. Individual Testing by the Binet-Simon Method. Two credit hours. One Quarter. Autumn and Winter. Two laboratory periods each week. Reports, laboratory demonstrations, and individual testing. General prerequisites must include fifteen hours of psychology or ten hours of psychology and five hours of professional educational subjects or sociology. Mr. Maxfield, Mr. Durea.

Practice in the technique of the 1937 Stanford revision of the Binet-Simon scale for measuring intelligence. Brief historical and descriptive treatment of the Binet scale, followed by intensive training in its practical use.

Given in the Summer of 1943.

617. Advanced Clinical Techniques. Two credit hours. Winter Quarter. Two laboratory periods each week. Laboratory work in clinical techniques. General prerequisites must include Psychology 616. Mr. Maxfield.

Advanced study and application of the Binet-Simon method with a review of various revisions (Kuhlmann, Herring, and Hayes). The Wechsler-Bellevue test for adults. The Rorschach test. A review of new clinical tests recently published. Test methods used with infants. Preliminary training in the preparation of clinical histories.

618. Clinical Tests. Two credit hours. One Quarter. Autumn and Spring. Two laboratory periods each week. Laboratory demonstrations and individual testing. General prerequisites must include fifteen hours of psychology. Mr. Maxfield, Mr. Durea.

Descriptive and practical laboratory study of standard diagnostic tests and techniques, particularly those known as performance tests.

Given in the Summer of 1943.

619. Psychological Clinic. Two or four credit hours. One Quarter. Autumn, Winter, Spring. One four-hour laboratory period each week. Clinic practicum. Individual case studies, reports, case conferences, home visits, and clinical procedure. May be taken for one or two Quarters with a maximum credit of four hours. General prerequisites must include Psychology 616 and 618. Mr. Maxfield, Mr. Rogers, Mr. Durea.

Theory and practice of clinical case study, including family history, personal history, school history, and social history. Interpretation of reports of medical examiners, teachers, social agencies, etc., as well as interpretation of test results. Participation in the regular work of the Psychological Clinic conducted by the Department of Psychology. Training in the preparation of clinical reports.

NOTE: Because of demand for psychological service by parents, schools and a variety of social and welfare agencies the psychological clinic operates throughout the year. A student may profitably receive the special training which this course gives for a Quarter. Repetition does not involve repetition of content but additional practice in clinical procedure.

Given in the Summer of 1943.

620. Advanced Psychological Clinic. Two or four credit hours; may be taken for one or more Quarters with a maximum credit of ten hours. One

* Not given in 1943-1944.

Quarter. Autumn, Winter, Spring. Assignments equivalent to two laboratory periods each week. General prerequisites must include Psychology 619 or permission of the instructor must be obtained. (Students are advised to consult instructor before registering.)

This course is designed for students who qualify as having developed a mature clinical point of view. Students will engage in actual clinical service, under the supervision of the instructor. Cases will be studied in the Psychological Clinic and in the nearby public schools and institutions. Special training in the diagnosis of borderline, psychopathic and doubtful cases. Case studies involving psycho-educational or behavior problems. Follow-up work on cases previously studied in the clinic. Problems of educational and vocational guidance. Advanced training in the preparation of clinical reports. Students expecting to deal with problems of college personnel will be assigned to work in this field.

NOTE: A student may profitably receive the special training which this course gives for additional Quarters. Repetition does not involve repetition of content but additional practice in clinical procedure.

Given in the Summer of 1943.

621. Social Psychology. Three credit hours. Autumn Quarter. Three lecture hours each week. Mr. Williams.

The nature and variety of innate tendencies; the relation of these tendencies to acquired behavior and social control; the development of personality.

Given in the Summer of 1943.

622. Delinquent Children. Three credit hours. Spring Quarter. Three lecture hours each week. Lectures, reports, and visits to the Bureau of Juvenile Research. General prerequisites must include thirteen hours of psychology. If this does not include Psychology 609, permission of the instructor must be obtained. Mr. Maxfield, Mr. Durea.

The meaning and significance of delinquency; its psychological basis; causes and prevention; the home and school as factors determining delinquent behavior; the significance of psychological findings for juvenile court procedure; present-day methods of dealing with the problem. The psychology of social conformity versus non-conformity; i.e. misconduct, whether technically delinquent or not.

Given in the Summer of 1943.

624. Psychology of Vision and Hearing. Five credit hours. Spring Quarter. Five lectures each week. Mr. Williams.

Production, measurement and control of photic stimuli and measurements of the variations in their effectiveness as determined by physical and physiological factors. The work will consist in part of lecture-demonstrations and experiments and in part of a critical study of the reports of original authors. Special attention will be given to the facts and hypotheses of color-vision and to visual problems in industry.

626. Learning and Thinking. Five credit hours. Winter Quarter. Five lecture and discussion hours each week. Mr. Renshaw.

The development of the principles which underlie the acquired modifications of human behavior.

628. Principles and Economy of Learning. Three credit hours. Spring Quarter. Three lectures each week. Lectures, readings in monographs and journals, discussions. General prerequisites must include permission of the instructor and sixteen hours of psychology or graduate standing. Mr. English.

The control of learning activities; memory and forgetting; transfer of training; generalization and thinking in relation to memory; the more elaborate types of learning such as are seen in school work. Special attention will be paid to recent experimentation and theories.

Given in the Summer of 1943.

629. Advanced Psychology. Five credit hours. Autumn Quarter. Five lectures each week. Miss Rogers.

The purpose of this course is to give a larger background to the advanced student of psychology, with respect to other disciplines, especially the sciences, leading to a systematic development of the more complex experiences.

630. Psychology of Feeling and Emotion. Five credit hours. Spring Quarter. Five lectures each week. Miss Rogers.

A study of the various theories of feeling and emotion and the fundamental relations of emotion to other experiences, personality and adjustments. Emotions in relation to various physiological activities. Methods of investigating emotion.

Given in the Summer of 1943.

631. Psychological Theories of Ability. Three credit hours. Winter Quarter. Three lecture hours each week. Mr. English.

Critical consideration of naïve ideas about ability; faculty psychology. Influence of Darwinism on conceptions of intelligence. Early mental testing. Binet and his successors. Test results and theories of intelligence. Problems of special abilities and of mental types. Relation of measurement of ability to systematic psychology.

634. Criminal and Legal Psychology. Three credit hours. Winter Quarter. Three lectures each week. Mr. Burtt.

Psychological factors in the determination of reliability of testimony; the technique of detecting crime and falsehood; responsibility; the relation of crime to mental disease or defect; the prevention of crime through environmental factors and heredity.

635. Psychology of Advertising. Three credit hours. One Quarter. Autumn and Spring. Three lectures each week. Mr. Burtt, Mr. Baker.

The psychological principles involved in effective advertising, notably attention, memory and action, with the contributory factors of association, feeling, instinct, suggestion, and reasoning.

637. Industrial Psychology. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Burtt.

The application of psychology to problems of industrial learning, adjustment of technical to mental factors, monotony, fatigue, environmental conditions, industrial unrest, morale, and accidents

***638. Industrial and Vocational Psychology Laboratory.** Three credit hours. Spring Quarter. Two three-hour laboratory periods each week. In addition to the general prerequisites the permission of the instructor must be obtained. Mr. Burtt.

Laboratory work in the application of psychology to industrial and vocational problems, with especial emphasis on the development of psychological techniques for hiring employees. Practice in the devising and standardizing of occupational tests; obtaining and evaluating production ratings; correlation of ratings and tests; interpretation of results from the standpoint of vocational selection or guidance.

639. Psychology and Personnel. Three credit hours. Winter Quarter. Three lectures each week. Mr. Burtt.

The application of psychology to problems of personnel. Selection and placement of employees by tests of intelligence and special ability. Trade tests, job analysis, and rating scales.

640. Educational and Vocational Guidance. Three credit hours. Winter Quarter. Mr. Toops, Mr. Doty.

A course dealing with the technique of evaluating psychological and related factors as a basis for making educational and vocational recommendations to individuals. The place of vocational and educational tests, previous record, and personality traits in determination of choice of occupation or course of study.

Given in the Summer of 1943.

641. Abnormal Psychology. Five credit hours. Winter Quarter. Five lectures each week. Lectures and reports. Mr. Durea.

An orientation in the problem of abnormal behavior from a clinical and experimental point of view. Discussion of syndromes exhibited in various types of abnormality of both major and minor degrees. Functional disorders stressed. Implications of abnormal behavior for normal conduct. Clinics and demonstrations at the Columbus State Hospital.

***642. Psychopathology.** Three credit hours. Spring Quarter. Three lectures each week. Lectures and reports.

This course will deal with the unusual (so-called pathological) manifestations of mind. Beginning with a consideration of subconscious phenomena—sleep, dreams, hypnosis, automatic writing, etc., there will be discussed: phobias, suggestion, the psychological aspects of hysteria, and multiple personality, psychasthenia, neurasthenia, and other disorders of personality.

644. The Technique of Human Motivation. Three credit hours. Spring Quarter. Three hours each week. Lectures, recitations, and assigned readings. Mr. Toops, Mr. Baker.

The psychological bases of initiation and improvement of work. The role of instinct, habit, custom, and tradition, rationalization and psychopathy in motivation. The incentive values of self-ratings, competition, punishment, and such rewards as money, bonuses, participation, and promotion, in relation to the capacities of individuals.

* Not given in 1943-1944.

645. History of Psychology. Five credit hours. Autumn Quarter. Five lectures each week. General prerequisites must include sixteen hours in psychology. Mr. Williams.

The course aims to view modern psychological problems in the light of their historical antecedents. The development of various theories such as those of sensation, attention, space perception, and emotion will be traced from earliest times to the present. As far as possible assignments will involve reference to original sources.

646. Contemporary Viewpoints in Psychology. Three credit hours. Spring Quarter. Three lectures each week. General prerequisites must include fifteen hours in psychology. Mr. Dockeray.

A consideration of the contributions of various schools beginning with structuralists, functionalists, and behaviorists. Special attention will be given to the points of view of leading psychologists of the present. Such concepts as Gestalt, topology and operational definitions will be especially considered.

647. Theoretical Psychology. Three credit hours. Winter Quarter. Three lectures each week. General prerequisites must include sixteen hours in psychology. Mr. Dockeray.

An attempt at an organization of the data of psychology into a consistent system. Students will be given an opportunity to express their preferences in the development of their own systematic points of view.

650. Minor Problems. One or more credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include sixteen hours in psychology and the permission of the instructor must be obtained. All instructors.

Investigation of minor problems in the various fields of psychology.

By permission of the Chairman of the Department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

Given in the Summer of 1943.

***652. Psychology of High School Subjects.** Three credit hours. Spring Quarter. Three lectures each week. General prerequisites must include a course in educational psychology. Mr. Pressey.

An analysis of the specific psychological processes involved in algebra, language, science, and other high school subjects, with consideration of the conditions which promote learning in each subject, and examination of textbooks and methods from this point of view.

655. Comparative Psychology. Five credit hours. Autumn Quarter. Five lectures each week. Mr. Dockeray.

The principles of animal behavior in relation to human behavior. A study of the similarities and differences in the behavior of animals and of humans and the explanation of these similarities and differences, with special reference to those principles definitely involved in the organism's mode of adjusting to its environment.

656. Comparative Psychology. Three credit hours. Spring Quarter. Three lectures each week. General prerequisites must include Psychology 655. Mr. Dockeray.

A continuation of Psychology 655. Devoted largely to contemporary literature in comparative psychology.

***659. University Personnel Psychology.** Three credit hours. Autumn Quarter. Two lectures and one two-hour laboratory period each week. Given in alternate years. Mr. Toops.

A course designed for students who are preparing for positions in vocational guidance or personnel work in universities and those interested in the achievement of adults. The giving, scoring and interpretation of tests of university entrants. Reading tests and tests of special capacities for adults. Planning a testing program for adults. Theories of adult testing. Comparative study of University personnel programs and procedures. The content of the course will vary somewhat from year to year.

661. Psycho-Educational Problems. Two credit hours. One Quarter. Autumn, Winter, Spring. One four-hour period each week. Clinical studies of pupils presenting psycho-educational problems, under direction of instructor. General prerequisites must include Psychology 619 and permission of instruc-

* Not given in 1943-1944.

tor must be obtained. May be taken for one or two Quarters with a maximum credit of four hours. Mr. Maxfield, Mr. Durea, Mr. Robinson, Mr. Rogers.

A student will be assigned to a public school where under direction of the principal he will make studies of individual pupils. Practical experience in problems of child guidance and educational adjustment as required by students who expect to become student counselors, visiting teachers, or psycho-clinicians. Some diagnostic and remedial teaching. Preparation of reports to the principal under direction of instructor.

NOTE: A student may profitably receive the special training which this course gives for a second Quarter. Repetition does not involve repetition of content but additional practice in clinical procedure.

662. Pre-School Child. Three credit hours. Spring Quarter. Two lectures and one conference hour each week. Mr. Dockeray.

A special study of the child from birth to six years. The relation of maturation to learning frustration and social development is examined with emphasis on the practical applications in the home and school. The theoretical implications for an understanding of adult behavior are also considered. Opportunity will be afforded for students with special interests to work along these lines individually or in groups.

Given in the Summer of 1943.

663. Psychology of the Elementary School Period. Four credit hours. Autumn Quarter. Four class meetings each week. Mr. English, Mr. Pressey.

The psychological development of the child from five to twelve years. Effects of the school and out-of-school activities on development. Analysis of significant psychological problems involved in curricular activities. Provision by school and other social agencies for the psychological needs of the child.

Given in the Summer of 1943.

664. Observation of the Elementary School Child. One or two credit hours. One credit hour for Graduate students. One Quarter. Autumn, Winter, Spring. General prerequisites must include Psychology 663. If taken any other Quarter than the one following that in which Psychology 663 is taken, special permission of the instructor must be obtained in advance. Mr. English, Mr. Pressey, Mr. Robinson.

Observation of a particular individual child at least one hour weekly over a twenty-week period. Preparation of a detailed report of observations, together with an evaluation of test results, school records, physical and mental examination and case-history records of this individual.

NOTE: The observations should normally begin about the middle of the Quarter during which Psychology 663 is being taken and be continued to the end of the following Quarter. Only in highly special cases can the observations be condensed into less than twenty weeks as the essential objective is a long-continued acquaintance with a developing child.

Given in the Summer of 1943.

†665. The Psychology of Character Formation. Three credit hours. Spring Quarter. Three meetings each week. General prerequisites must include ten hours in psychology. Mr. English.

Psychological analyses of character, in which are brought out the relation of character to its biological bases and its distinction from personality. Major attention is given to recent experimental studies of morale and of attitudes as factors in character, of the measurement of character and of the effect of varying environment influences on character.

Given in the Summer of 1943.

667. Psychology of Music. Three credit hours. Winter Quarter. General prerequisites must include a course in educational psychology and a course in advanced harmony or consent of the instructor must be obtained. Mr. Wilson.

The contribution of rhythm, harmony, tone color, form, familiarity, voice and tactual association to the emotional experience in music. Analysis and measurement of musical talent. Psychological factors in musical interpretation and in the teaching of music.

Given in the Summer of 1943.

668. Principles of Gestalt Psychology. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Williams.

A survey of the experimental work which supplied the data for the Gestaltist. A study of the basic dynamic principles which constitute the Gestalt system. Application of these principles to perception, learning, thinking, and emotion.

† Not given during the academic year, 1943-1944.

669. Gifted Children. Three credit hours. Winter Quarter. Lectures, readings, and reports. General prerequisites must include thirteen hours of psychology. If this does not include Psychology 609, permission of the instructor must be obtained. Mr. Berry.

A study of the nature, development, and education of the gifted child with special reference to those psychological traits that distinguished him from the typical child.

Given in the Summer of 1943.

670. Psychological Problems of Adult Life. Three credit hours. Spring Quarter. Mr. Pressey.

A survey of the important recent psychological literature on changes in capacity for learning through the adult years and into old age, changes in incentives and interests throughout these years, emotional development and orientation of adults, psychological problems of work adjustment, adult and parent education, leisure.

Not open to students who have credit for Psychology 825.

Given in the Summer of 1943.

671. Principles of Treating the Problem Child. Three credit hours. One Quarter. Spring Quarter. Three lecture hours each week with lectures, recitations and reports. General prerequisites must include thirteen hours of psychology. If this does not include Psychology 609, permission of the instructor must be obtained. Mr. Rogers.

For prospective teachers, counselors and clinicians. A survey of treatment procedures and resources. Methods used in dealing with behavior and personality problems. The flexible use of school environment and community resources, methods of altering attitudes of parent and child, and direct treatment approaches.

Given in the Summer of 1943.

674. Research Problems of the Dean of Women. One or more credit hours. Autumn, Winter, and Spring Quarters. General prerequisites must include Survey 665 or its equivalent, and the approval of the instructor must be obtained. Mrs. Gaw.

Investigation of the minor psychological problems which arise in connection with the social, scholastic, and vocational adjustments of undergraduate women.

Given in the Summer of 1943.

*676. Methods and Viewpoints in Educational Psychology. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Pressey, Mr. Robinson.

A course in advanced educational psychology giving a critical appraisal of the implications for education of modern psychological findings.

678. Psychology of Personality. Three credit hours. Spring Quarter. Three lectures each week. Mr. Durea, Mr. Rogers.

This course will consider the individual both as a social and biological unit, relating each group of factors to the development of personality. Ample attention will be given to questions such as integration, measurement of traits, personality types, faulty schemes of character analysis; effect of glands of internal secretion; self-analysis. The course is correlative to Psychology 641.

Given in the Summer of 1943.

679. Psychology of Public Attitudes. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Baker.

The influence of imitation, suggestion, transfer of emotions, postural set, and defense mechanisms on public attitudes. Psychological factors in leadership and morale. Special emphasis on the experimental approach and such techniques as scaling attitudes and factor analysis.

Given in the Summer of 1943.

680. Educational Tests and Measurements. Three credit hours. Spring Quarter. Three lectures each week. Assigned readings and reports. Open to seniors and graduate students of experience with permission of the instructor in charge. Mr. Heck, Mr. Pressey.

A service course for those majoring in Elementary and Secondary Education and School Administration. The course will consider selection of tests and organization of testing programs for elementary and secondary schools; the use of tests in classification, diagnosis, prognosis, and educational guidance; the principles of teacher-made tests; and effect of testing on marking systems.

Given in the Summer of 1943.

* Not given in 1943-1944.

681. Psychology of Diagnostic and Corrective Instruction in Secondary Education. Three to five credit hours; this course may be repeated until ten hours have been earned. One Quarter. Autumn, Winter, Spring. One lecture, one conference, and five laboratory hours each week. General prerequisites must include thirteen hours of psychology and permission of the instructor must be obtained. Enrollment is limited by extent of laboratory facilities. Mr. Robinson.

Psychological principles involved in aiding students in high school and college in their adjustment to curricular and extra-curricular activities. This includes methods of psycho-educational diagnosis, principles of effective learning and remedial reading instruction. Laboratory practice is obtained by assisting beginning college students with such problems.

NOTE: It is suggested that students may find considerable profit in repeating the course. Such repetition represents additional experience and meeting a greater variety of problems.

Given in the Summer of 1943.

†683. Psychology of Reading. Three credit hours. Spring Quarter. Three lecture and discussion hours each week. Mr. Robinson.

Psychological analysis of the reading process. The relationship of this to teaching and remedial methods. Discussion of remedial reading techniques.

Given in the Summer of 1943.

685. Educational and Vocational Guidance Laboratory. Three to five credit hours; this course may be repeated until ten hours have been earned. One Quarter. Autumn, Winter, Spring. One two-hour lecture, discussion and demonstration period and three to six hours of practical experience each week in counseling and related activities. Permission of the instructor must be obtained. General prerequisites must include Psychology 689. Mr. Edgerton, Mr. Doty.

An opportunity for mature students who have adequate background to obtain practical experience in guidance and counseling. Practice in counseling with out-of-school youth between 18 and 25 years of age, with parents, employers, and social agencies. At present the counseling is done through the facilities of the Columbus Counseling Center at the State Employment Service.

NOTE: It is suggested that students may find considerable profit in repeating the course. Such repetition represents additional experience and meeting a greater variety of problems.

Given in the Summer of 1943.

688. Laboratory in Employment Techniques. Four or five credit hours. One Quarter. Winter and Spring. Two lecture hours and four to six laboratory hours each week. General prerequisites must include Psychology 689. Mr. Bowman.

Employment interviewing and occupational classification, including use of Dictionary of Occupations; description and interpretation of work samples and psychological tests; actual supervised practice in employment interviewing, classification, placement employer calls, and administration of work samples and tests in the Ohio State Employment Service.

Given in the Summer of 1943.

689. Occupational Information. Three credit hours. One Quarter. Autumn and Spring. Two two-hour meetings each week. Lectures, discussions, field trips. Mr. Bowman.

A survey of occupations and occupational information for guidance counselors and employment interviewers; study of the literature on occupations and occupational information; writing of occupational analyses; field trips to places of employment, to observe workers at work; finding filing and use of occupational information for employment and guidance purposes.

Given in the Summer of 1943.

690. Mental Hygiene for Professional Workers. Three credit hours. Winter Quarter. Mr. Rogers, Mr. Durea, Mrs. Stogdill.

This course is designed to provide an understanding of the individual and his adjustive behavior. Attention is given to the factors which influence behavior, the dynamics and motivation of behavior; the varieties of adjustive behavior. Consideration is given to the principles and methods of psychological readjustment and re-education. The illustrative material will be selected to be pertinent to the problems of teachers, personnel, and guidance workers, social workers, psychologists, occupational therapists, and other professional groups.

Not open to students who have credit for two or more of the following courses: Psychology 610, 663, 670, 678, 808.

Given in the Summer of 1943.

† Not given during the academic year, 1943-1944.

703. Special Topics in Psychology. Three credit hours. One Quarter. Winter and Spring. Lectures and discussions. General prerequisites must include fifteen Quarter hours of Psychology course in the "600" group or above and permission of the instructor. May not be elected more than twice. All instructors.

The topics will vary from Quarter to Quarter and will be announced at least one month in advance. The following are typical of the topics contemplated in the near future: factor analysis, technique of constructing personnel forms, techniques of the remedial interview, contribution of experimental neuroses to abnormal psychology, psychology of senility, punched card machine techniques for psychological statistics.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include the equivalent of at least two years of psychology; or of one year of psychology and one year of college work in one of the following subjects: philosophy, mathematics, physiology, physics, zoology, sociology.

802. Seminar in Experimental Psychology. Two credit hours. Autumn, and Winter Quarters. Mr. Renshaw, Mr. Dockeray, Miss Rogers.

803. Seminar in Educational Psychology. Two credit hours. Autumn and Spring Quarters. Mr. Pressey, Mr. English.

Given in the Summer of 1943.

*804. Seminar in Tests and Measurements. Two credit hours. Spring Quarter. Mr. Pressey.

805. Contemporary Psychological Literature. One credit hour. Autumn, Winter, and Spring Quarters. Mr. Renshaw.

806. Seminar in Clinical and Abnormal Psychology. Two credit hours. Autumn and Winter Quarters. Mr. Maxfield, Mr. Durea, Mr. Stogdill, Mr. Rogers.

807. Seminar in Industrial Psychology. Two credit hours. Winter Quarter.

808. Psychodynamics. Three credit hours. Winter Quarter. One two-hour period each week and one hour to be arranged. Mr. Durea.

Critical evaluation and interpretation of implications derived from the basic postulates of psycho-analysis, field theoretical approach, personalistic approach, and cultural factors. Reports and discussions of equal interest to graduate students in psychology, education, and social administration.

*810. Psychological Problems in Higher Education. Two credit hours. Autumn Quarter. One meeting each week. Mr. Pressey.

A critical review of the research work thus far done on such problems as study methods, background information essential for college work, individual differences, placement tests, measurement of progress. The course is intended to give graduate students preparing for college or university positions contact with current educational research regarding the problems they will meet, and develop a research attitude toward these problems.

811. Advanced Theoretical Psychology. Three credit hours. Autumn Quarter. Three lectures each week. General prerequisites must include Psychology 647. Mr. Dockeray.

814. Advanced Statistics. Four credit hours. Winter Quarter. Two lectures and two two-hour laboratory periods each week. General prerequisites must include a course in educational statistics or permission of the instructor. Mr. Toops.

Special cases in correlation; non-linear regression; construction of criteria; sampling; statistical machines; derivation of commonly used equations; critical readings; construction of tables and graphs to meet the research needs of individual students.

* Not given in 1943-1944.

815. Seminar in Psychological Statistics. Two credit hours in each of two successive Quarters. Autumn and Winter Quarters. One two-hour discussion period each week. Mr. Toops, Mr. Edgerton.

Statistical background equivalent to the sequence Psychology 608, 814 is assumed. Critical discussion of problems in the forefront of statistical psychology.

816. Special Statistical Methods. Four credit hours. Spring Quarter. Two lectures and two two-hour laboratory periods each week. General prerequisites must include Psychology 608 and 814 or equivalent. Mr. Toops.

The statistics of aptitudes, mental growth and attainment. Item analysis, quantification of qualitative data and pertinent psycho-physical theorems. Construction of tables and graphs to meet the individual needs of advanced students of psychology and education.

817. Clinical Treatment. Two or four credit hours. One Quarter. Autumn, Winter, Spring. Assignments equivalent to four or eight laboratory hours each week. A practicum. May be taken for one or two Quarters with maximum credit of four hours. General prerequisites must include Psychology 620, prior or concurrent. Mr. Rogers.

A clinic practicum for advanced students in clinical psychology. The student will carry out various types of treatment techniques including psychotherapy, with individual cases in the Psychological Clinic or elsewhere. In addition to the treatment of the individual, cooperation with schools and social agencies, conducting of case conferences, keeping treatment records, evaluation of results, will be a part of the practice.

***822. Seminar in Student Personnel Psychology.** Two credit hours. Spring Quarter. Mr. Robinson.

826. Practicum in the Use of Personality Adjustment Techniques. Three to five credit hours. Autumn, Winter, and Spring Quarters. This course may be repeated until ten credit hours have been earned. Lectures, group discussions, demonstrations, individual conferences, practical experience in interviewing, case recording, and related activities. General prerequisites must include twenty hours of psychology including one of the following courses: Psychology 619-620, 661, 681-682, 685, and permission of the instructor. The enrollment is limited by the extent of laboratory facilities. Mrs. Stogdill.

An opportunity for mature students with adequate background and training to obtain practical experience, under guidance, in the use of personality adjustment techniques at the college level.

NOTE: It is suggested that students may find it profitable to repeat the course. Such repetition represents additional experience in meeting a greater variety of problem situations.

831. Advanced Experimental Laboratory. Three to fifteen credit hours. Autumn, Winter, and Spring Quarters. May be taken one, two or three Quarters with a maximum credit of fifteen hours. Laboratory and conferences. Admission only after consultation with the instructor. Mr. Renshaw.

Quantitative methods in sensory fields, advanced studies in perception, learning, and memory.

950. Research in Psychology. Autumn, Winter, and Spring Quarters. All instructors.

Primarily intended for students offering theses for advanced degrees.

By permission of the Chairman of the Department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

Given in the Summer of 1943.

PUBLIC ADMINISTRATION

It is the object of this course to prepare students for responsible posts in government service, particularly in administrative work. Public personnel administration, budget administration, public reporting, taxation and public finance, legislative drafting, governmental research, governmental accounting, and other fields not included in other profesional curricula of the University, all offer opportunities for a career. The student who secures both a broad foundation and a grasp of technique is in demand both by government and by private research agencies. A broad foundation is offered by the undergraduate curriculum in public administration in the College of Commerce and Administration or its equivalent. The detailed requirements

* Not given in 1943-1944.

of this undergraduate curriculum and of the graduate curriculum which follows are subject to modification to meet the needs of individual students. Students who have not met these requirements of a broad background in the fields of government and economics may find it necessary to spend a somewhat longer time on their graduate work in order to complete the work for the degree.

REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN PUBLIC ADMINISTRATION

To receive this degree, students must be in residence at The Ohio State University for at least three Quarters and an additional Quarter must be devoted to field work with some governmental or research agency approved by the adviser. A report upon such field work must be filed with the adviser and approved by him. Organizations with which field work may be done include: federal government agencies, the State of Ohio, the principal cities of the state, the important counties of Ohio, public and private governmental research, and numerous other organizations of local or state-wide scope. Candidates for the degree of Master of Science in Public Administration must also meet the same requirements in regard to a thesis and final examination as are prescribed for the degrees of Master of Arts and Master of Science.

CURRICULUM IN PUBLIC ADMINISTRATION

GENERAL REQUIRED COURSES

Autumn Quarter			Winter Quarter			Spring Quarter		
Political Science Research in Political Science	(950)	3-5	Political Science Research in Political Science	(950)	3-5	Political Science Research in Political Science	(950)	3-5
Political Science Research in Public Administration	(808)	3-5	Political Science Research in Municipal Government	(809)	3-5	Political Science Public Opinion and Political Parties	(807)	3-5

PUBLIC PERSONNEL ADMINISTRATION (OPTIONAL)

Psychology Industrial Psychology	(637)	3	Psychology Mental and Educational Tests	(618)	3	Psychology Clinical Tests	(618)	2
Business Organization Industrial Organization and Management	(680)	5	Psychology Psychology and Personnel	(639)	3	Business Organization Personnel Organization and Management	(686)	3
Psychology Individual Testing	(616)	2	Psychology Criminal and Legal Psychology	(634)	3	Business Organization Office Organization and Management	(691)	3
			Industrial Engineering Management of Men in Engineering Industries	(601)	4			

BUDGETING AND PUBLIC FINANCE (OPTIONAL)

Economics Public Finance	(631)	3	Economics Public Finance	(632)	3	Economics Public Finance	(638)	3
Economics Statistical Analysis	(807)	2	Economics Statistical Analysis	(808)	2	Economics Social Insurance	(639)	3
Accounting Cost Accounting	(603)	5	Accounting Cost Accounting	(604)	5	Economics Statistical Analysis	(809)	2
						Accounting Governmental Accounting and Budgeting	(630)	3

MUNICIPAL ADMINISTRATION (OPTIONAL)

Economics Public Control of Industry	(865)	2	Economics Public Control of Industry	(866)	2	Economics Public Control of Industry	(867)	2
Social Administration Penology	(626)	3	Social Administration Social Statistics	(639)	5	Social Administration Community Organization	(668)	3
Civil Engineering Sanitary Engineering	(602)	5	Social Administration Public Recreation	(855)	3	Law Municipal Corporations		3

RHETORIC AND ENGLISH LANGUAGE

(See Speech)

ROMANCE LANGUAGES AND LITERATURES

Office, 111 Derby Hall

PROFESSORS HENDRIX, MOORE, HAVENS, ROCKWOOD, MONROE, ANIBAL, DEMOREST, AND SCHUTZ, ASSISTANT PROFESSOR GUTIERREZ

Students intending to major in Romance Languages are urged to elect the following courses outside the department: History of France (History 624, 625), Principles of the Historical Study of Language (German 705), the History of Philosophy (Philosophy 601-602-603), Vulgar Latin (Latin 627). No student will be considered as a candidate for the M.A. degree unless his program includes at least two courses exclusively for graduates.

French 801 and 802 are required of candidates for the Master's degree in French.

Spanish 805 and 806 are required of candidates for the Master's degree in Spanish.

GRADUATE ROMANCE CLUB

The Graduate Romance Club fosters an interest in advanced work in the Romance Languages and Literatures. Its meetings, held monthly, consist of reports by graduate students or faculty members on their own investigations as well as on books and articles bearing on the field. The problems of graduate students and themes suggested by faculty members will be discussed. Regular attendance of graduate students in the department is strongly urged.

FRENCH

Requirements for the Master's Degree: French: Graduate work in this field presents two main aspects: the linguistic, the literary. The candidate for the Master's degree should have: (1) a good command of written and oral French (to be tested by examination during one of the early Quarters of graduate work); (2) a general knowledge of the development of the French language from the earliest times and of French literature from the 16th century on. The final comprehensive examination covering the above fields will be written. A minimum reading list as a general guide in the preparation for this examination can be obtained at the office of the Department of Romance Languages.

In addition to the advanced courses (or their equivalent) covering the field of the final written examination, the candidate should complete French 801, 802, 813 (Old French language and literature), 880 (Methods of Research), and at least two seminars in French Literature (French 811, 812, or 817). The Master's thesis may deal either with a linguistic or a literary subject. The final oral examination will be devoted chiefly to the field of the thesis and will be conducted at least partly in French.

Requirements for the Doctor's Degree: French as Major: In addition to the requirements for the Master's degree in French, as outlined above, the candidate should have a more extensive and a more intensive knowledge of French linguistics and literature, with emphasis upon one field or the other, according to the nature of the specialization indicated by the dissertation. This knowledge should include Old French language and literature, and either old Spanish or Old Italian language.

The candidate should have first and second minor fields, ordinarily represented by the Spanish (including Spanish-American) and the Italian languages and literatures. Reading lists as guides in the preparation of these fields can be obtained at the office of the Department of Romance Languages. Written examinations in the minor fields should be completed at least one Quarter before the general written and oral examinations in the major. The language requirements of the Graduate School, which normally involve a reading knowledge of French and German, must be met before the candidate takes his general examinations in his major field. These examinations are given not later than the middle of the second Quarter prior to the Quarter in which the candidate plans to come up for his degree.

The doctoral dissertation may deal either with a linguistic or a literary subject related to French. A final oral examination, conducted at least partly in French, is given in the field of the dissertation.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

603. The Romantic Period in French Literature, 1800-1850. Five credit hours. Autumn Quarter. Five recitations each week. Lectures, collateral reading and reports. Given biennially, alternating with French 604. General prerequisites must include an introductory course in modern French literature. Mr. Demorest.

The development of romanticism and rise of realism in the first half of the Nineteenth Century in the novel, poetry, and drama.

†604. **French Literary Currents, 1850-1914.** Five credit hours. Autumn Quarter. Five recitations each week. Lectures, collateral reading, discussions, reports. Given biennially, alternating with French 603. General prerequisites must include an introductory course in modern French literature. Mr. Demorest.

Realism, naturalism, and the movements or reaction in the novel and drama. The Parnassians and the Symbolists in poetry. Modern French literary critics.

Given in the Summer of 1943.

616. **French Literature of the Renaissance.** Five credit hours. Spring Quarter. Five recitations each week. Given biennially, alternating with French 617. General prerequisites must include an introductory course in modern French literature. Mr. Moore.

Marot, Rabelais, the Pléiade, Montaigne.

*617. **French Classicism, 1600-1715.** Five credit hours. Spring Quarter. Five recitations each week. Given biennially, alternating with French 616. General prerequisites must include an introductory course in modern French literature.

The formation of the classic spirit. The perfection of dramatic form and the Seventeenth Century portrait of man. Selected works of Malherbe, Descartes, Pascal, La Bruyère, Boileau, Corneille, Molière, and Racine.

*618. **French Literature of the Enlightenment.** Five credit hours. Winter Quarter. Five recitations each week. Given biennially, alternating with French 640. Mr. Havens.

A study of the ideas of the Eighteenth Century in their relation to modern times. Special emphasis on Montesquieu, Voltaire, Diderot, and Rousseau.

619. **French Translating and Interpreting.** Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include six Quarters of French or the equivalent with a grade not lower than "C". Mr. Havens.

Translating from French to English and from English to French. Practices in rapid oral and written interpretation. This course is helpful in preparing for military, diplomatic, or other special service where exact linguistic knowledge is needed.

Given in the Summer of 1943.

*627. **French Pronunciation.** Three credit hours. Three meetings each week with laboratory practice. General prerequisites must include six Quarters of collegiate French or the equivalent, with a grade not less than "C" and permission of the instructor must be obtained. This class is limited to twelve.

The formation of French sounds. Lectures, with exercises in the use of the symbols of the International Phonetic Association. A systematic study of the rules of French pronunciation. Careful drill in the reading of French. Designed for advanced students who expect to teach French.

Not open to students who have credit for French 632.

628. **Modern French Syntax.** Five credit hours. Autumn Quarter. General prerequisites must include six Quarters of collegiate French or the equivalent, with a grade of "C," or consent of the instructor. Mr. Schutz.

A careful study of French grammar, with composition to illustrate. Designed for advanced students who expect to teach French.

*632. **French Pronunciation and Diction.** Five credit hours. Winter Quarter. Five meetings each week with laboratory practice. General prerequisites must include six Quarters of collegiate French or the equivalent, with a grade not less than "C" and permission of the instructor must be obtained. The class is limited to twelve.

The formation of French sounds. Lectures, with exercises in the use of the symbols of the International Phonetic Association. A systematic study of the rules of French pronunciation and diction. Careful drill in the reading of French. Designed for advanced students who expect to teach French.

Not open to students who have credit for French 627.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

*635. Cours de Civilisation Française. Three credit hours. Spring Quarter. General prerequisites must include the equivalent of six Quarters of French and permission of the instructor. The class is limited to fifteen. Given in alternate years.

A study of the major developments of French culture down to the Nineteenth Century. The course is designed to give the student greater facility in understanding, speaking, and writing French.

636. La Civilisation Française Moderne. Three credit hours. Spring Quarter. General prerequisites must include the equivalent of six Quarters of French. The course is conducted in French. Mr. Demorest.

The principal object of the course is to increase the student's facility in understanding, speaking, and writing French. The material for discussion is drawn from the life, institutions, and culture of Nineteenth and Twentieth Century France.

640. France in Contemporary Literature. Five credit hours. Winter Quarter. Lectures, collateral readings, and reports. General prerequisites must include an introductory course in French literature.

Recent developments in the novel, essay and poetry and their relationships with French life. Proust, Gide, Barbusse, Duhamel, Maurois, Romains, Morand, Malraux, Colette, Claudel, Valery, and others. Regionalism, etc.

660. French Literature from the Renaissance to the Revolution. Five credit hours. Winter Quarter. Five class meetings each week. Lectures, collateral readings, and reports. General prerequisites must include an introductory course in French literature. Mr. Havens.

A survey of the main writers and tendencies of the Renaissance in France, of French Classicism, and of the eighteenth century Enlightenment, with special reference to inter-relations with English literature.

This course is intended for students not majoring in Romance Languages.

701. Minor Problems in French. Three to five credit hours. Autumn, Winter, and Spring Quarters. Professors and Associate Professors.

Given in the Summer of 1943.

NOTE: TEACHING COURSES. For the Teaching Course in this department see the Department of Education, Course 692.

ITALIAN

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

*601. Modern Italian Literature, 1880-1850. Five credit hours. Spring Quarter. Five recitations each week. Given in alternate years. Mr. Moore.

Foscolo, Manzoni, Pellico, Leopardi.

*611. Dante's Life and Works. Three credit hours. Winter Quarter. Three lectures each week. Given in alternate years. General prerequisites must include Italian 602 or the permission of the instructor must be obtained. Mr. Moore.

Reading of the *Vita Nuova* and *The Inferno*, Cantos 1-16.

701. Minor Problems in Italian. Three to five credit hours. Autumn, Winter, and Spring Quarters. Mr. Moore.

PORTUGUESE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

607. Contemporary Brazilian Literature. Five credit hours. Spring Quarter. Four recitations each week, a fifth at the option of the instructor. General prerequisites must include an introductory course in modern Brazilian literature.

* Not given in 1943-1944.

701. Minor Problems in Portuguese. Three to five credit hours. Autumn, Winter, and Spring Quarters.

SPANISH

Requirements for the Master's Degree: Spanish: Graduate work in this field presents two main aspects: the linguistic, the literary. The candidate for the Master's degree should have: (1) a good command of written and oral Spanish (to be tested by examination during one of the early Quarters of graduate work); (2) a general knowledge of the development of the Spanish language from the earliest times and of Spanish literature from 1500 on (Spanish-American literature may be substituted for certain of the modern Spanish literature courses upon the approval of the department). The final comprehensive examination covering the above fields will be written. A minimum reading list as a general guide in the preparation for this examination can be obtained at the office of the Department of Romance Languages.

In addition to the advanced courses (or their equivalent) covering the field of the final written examination, the candidate should complete Spanish 805, 806, 880 (Methods of Research) and at least two seminars in Spanish or Spanish-American literature. The Master's thesis may deal either with a linguistic or a literary subject. The final oral examination will be devoted chiefly to the field of the thesis and will be conducted at least partly in Spanish.

Requirements for the Doctor's Degree: Spanish as Major: In addition to the requirements for the Master's degree in Spanish, as outlined above, the candidate should have a more extensive and a more intensive knowledge of Spanish linguistics and literature, with emphasis upon one field or the other, according to the nature of the specialization indicated by the dissertation. This knowledge should include Old Spanish language and literature, and either Old French or Old Italian language.

The candidate should have first and second minor fields, ordinarily represented by the French and Italian languages and literatures. Reading lists as guides in the preparation of these fields can be obtained at the office of the Department of Romance Languages. Written examinations in the minor fields should be completed at least one Quarter before the general written and oral examinations in the major. The language requirements of the Graduate School, which normally involve a reading knowledge of French and German, must be met before the candidate takes his general examinations in his major field. These examinations are given not later than the middle of the second Quarter prior to the Quarter in which the candidate plans to come up for his degree.

The doctoral dissertation may deal either with a linguistic or a literary subject related to Spanish. A final oral examination, conducted at least partly in Spanish, is given in the field of the dissertation.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

605. Advanced Composition and Conversation. Three credit hours. Autumn Quarter. Three recitations each week. Given in alternate years. General prerequisites must include a course in Spanish composition and a "600" course in Spanish literature. Mr. Gutierrez.

This course, conducted wholly in Spanish, is designed especially for prospective teachers and for persons desiring a practical command of the language. The subject matter will be for the most part in history, customs, and manners of Spain.

606. Advanced Composition and Conversation (Continued). Three credit hours. Winter Quarter. Three recitations each week. Given in alternate years. General prerequisites must include Spanish 605. Mr. Gutierrez.

This course, conducted wholly in Spanish, is designed especially for prospective teachers and for persons desiring a practical command of the language. The subject matter will be for the most part in history, customs, and manners of Spain.

***607. The Modern Spanish Novel.** Five credit hours. Autumn Quarter. Four meetings each week, a fifth at the option of the instructor. Given biennially, alternating with Spanish 609-610. General prerequisites must include an introductory course in modern Spanish literature. Mr. Hendrix.

A careful study of the development of the modern Spanish novel, reading of representative authors. Lectures, collateral reading, and reports.

***608. The Modern Spanish Novel (Continued).** Five credit hours. Winter Quarter. Four meetings each week, a fifth at the option of the instructor.

* Not given in 1943-1944.

Given biennially, alternating with Spanish 609-610. General prerequisites must include an introductory course in modern Spanish literature. Mr. Hendrix.

A careful study of the development of the modern Spanish novel, reading of representative authors. Lectures, collateral reading, and reports.

*609. **Romantic Drama and Poetry in the Nineteenth Century.** Five credit hours. Autumn Quarter. Four meetings each week, a fifth at the option of the instructor. Given biennially, alternating with Spanish 607-608. General prerequisites must include an introductory course in modern Spanish literature. Mr. Hendrix.

A survey of the movements in Spanish drama and poetry during the first half of the nineteenth century. Lectures, collateral reading, and reports.

*610. **Modern Spanish Drama.** Five credit hours. Winter Quarter. Four meetings each week, a fifth at the option of the instructor. Given biennially, alternating with Spanish 607-608. General prerequisites must include an introductory course in modern Spanish literature. Mr. Hendrix.

A survey of the movements in Spanish drama and poetry during the second half of the nineteenth century. Lectures, collateral reading, and reports.

611. **Drama of the Golden Age.** Five credit hours. Spring Quarter. Four meetings each week, a fifth at the option of the instructor. Given in alternate years. General prerequisites must include an introductory course in modern Spanish literature. Mr. Anibal.

An intensive study of a limited number of plays of the representative dramatists. Lectures, collateral reading, discussion, and reports.

*613. **The Picaresque Novel.** Five credit hours. Winter Quarter. Four meetings each week, a fifth at the option of the instructor. General prerequisites must include an introductory course in modern Spanish literature. Mr. Anibal.

An intensive study of Lazarillo de Tormes, Guzmán de Alfarache, and El Buscón. Lectures, collateral readings, discussion, and reports.

*614. **Cervantes.** Five credit hours. Autumn Quarter. Four meetings each week, a fifth at the option of the instructor. Given in alternate years. General prerequisites must include an introductory course in modern Spanish literature. Mr. Anibal.

A study of the works of Cervantes with especial emphasis on the Quixote. Lectures, collateral reading, discussion, and reports.

615. **Survey of Spanish Literature from the Earliest Times to the Seventeenth Century.** Five credit hours. Winter Quarter. Four meetings each week, a fifth at the option of the instructor. Given in alternate years. General prerequisites must include an introductory course in modern Spanish literature. Mr. Anibal.

Lectures, collateral reading, discussion, and reports.

616. **Survey of Spanish Literature of the Seventeenth and Eighteenth Centuries.** Five credit hours. Spring Quarter. Four meetings each week, a fifth at the option of the instructor. Given in alternate years. General prerequisites must include an introductory course in modern Spanish literature. Mr. Anibal.

Lectures, collateral reading, discussion, and reports.

617. **Modern Spanish Syntax.** Five credit hours. Autumn Quarter. Five recitations each week. General prerequisites must include an introductory course in modern Spanish literature. Mr. Anibal.

A course designed for advanced students who expect to teach Spanish. Appreciation of the details of grammar, illustrated with composition and with analysis of contemporary texts.

* Not given in 1943-1944.

620. Spanish Pronunciation and Diction. Five credit hours. Winter Quarter. Five recitations each week. General prerequisites must include an introductory course in modern Spanish literature.

Careful and detailed study of special problems involved in teaching Spanish to English-speaking students. Laboratory analysis of differences between English and Spanish pronunciation.

623. Spanish Translating and Interpreting. Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include Spanish 605, or equivalent, with a grade not lower than "C".

This course gives experience in rapid translation from English to Spanish and from Spanish to English such as may be demanded in military or diplomatic service.

626. The Spanish Drama of the Sixteenth Century. Five credit hours. Spring Quarter. Four meetings each week, a fifth at the option of the instructor. General prerequisites must include an introductory course in modern Spanish literature. Mr. Anibal.

630. Survey of Spanish-American Literature. Five credit hours. Spring Quarter. Four meetings each week, a fifth at the option of the instructor. General prerequisites must include an introductory course in modern Spanish literature. Mr. Hendrix.

A study of the masterpieces of Spanish-American literature up to 1900. Lectures, collateral reading, discussion, and reports.

*640. Spain in Twentieth Century Literature. Three credit hours. Lectures, collateral readings, and reports. General prerequisites must include an introductory course in modern Spanish literature. Mr. Hendrix.

The Generation of 1898, including essayists and others who contributed to the Revolution of 1936.

*641. Spain in Twentieth Century Literature (Continued). Three credit hours. Lectures, collateral readings, and reports. General prerequisites must include an introductory course in modern Spanish literature. Mr. Hendrix.

The Generation of 1898, including essayists and others who contributed to the Revolution of 1936.

650. Spanish America in Twentieth Century Literature. Three credit hours. Autumn Quarter. Lectures, collateral readings, and reports. General prerequisites must include an introductory course in modern Spanish literature. Mr. Hendrix.

The course will be devoted to Poets of the "New Generation" including Gabriela Mistral, Pedro Prado, Enrique Banchs, Alfonsina Storni, Vincente Huidobro, Juana de Ibarbourou and Jorge Louis Borges, and the contemporary novel of the Argentine, including the works of César Duayen, Roberto J. Payró, Enrique Rodríguez Larreta, Manuel Gálvez, Benito Lynch, Ricardo Güiraldes and Hugo Wast.

Given in the Summer of 1943.

651. Spanish America in Twentieth Century Literature (Continued). Three credit hours. Winter Quarter. Lectures, collateral readings and reports. General prerequisite must include an introductory course in modern Spanish literature. Mr. Hendrix.

This course will take up the contemporary novel of Uruguay in the works of Justino Zavala Muniz and Horacio Quiroga, in Chile of Eduardo Barrios and F. Santivan, in Bolivia of Alcides Arguedas, in Ecuador of Jorge Icaza, in Colombia of José Eustacio Rivera, in Venezuela of Rufino Blanco Fombona, Rómulo Gallegos, and Teresa de la Parra, in Mexico of Mariano Azuela, Rafael Delgado, José López Portillo y Rojas, Federico Gamboa, Mauricio Magdaleno, Lopez y Fuentes, Icaza, Rubén Romero, Mena Brito, and Enrique Rodríguez Larreta, in Guatemala of Rafael Arévalo Martínez, in Cuba of Loveira, and in Santo Domingo of Tulio M. Cestero.

Given in the Summer of 1943.

652. Spanish America in Twentieth Century Literature (Continued). Three credit hours. Spring Quarter. Lectures, collateral readings and reports.

* Not given in 1943-1944.

General prerequisites must include an introductory course in modern Spanish literature.

This course will take up the later works of contemporary writers in Spanish American literature.

*660. The Comedia of Lope de Vega and his School. Three credit hours. General prerequisites must include an introductory course in modern Spanish literature.

The development of Lope's formula and a study of representative plays; Tirso de Molina; Alarcón. Lectures, collateral reading, discussion, and reports.

701. Minor Problems in Spanish. Three to five credit hours. Autumn, Winter, and Spring Quarters. Mr. Anibal, Mr. Hendrix.

Given in the Summer of 1943.

NOTE: TEACHING COURSES. For the Teaching Course in this department see the Department of Education, Course 692.

ROMANCE LANGUAGES

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

FRENCH

801. Introduction to Old French Linguistics. Three credit hours. Winter Quarter. Three recitations each week. General prerequisites must include at least three years of collegiate French and some knowledge of Latin. French 813 is desirable but not essential. Mr. Schutz.

Elements of Old French phonology and morphology.

802. Introduction to Old French (Continued). Three credit hours. Spring Quarter. Three recitations each week. General prerequisites must include French 801. Mr. Moore.

Continuation of Old French phonology and morphology, semantics. Some attention to text criticism. A short review of current attitudes and practices in Romance philology.

*803. Old Provencal. Three credit hours. Winter Quarter. General prerequisites must include French 802. Mr. Schutz.

Study of the language and literature of the Troubadours; Appel's Provenzalische Chrestomathie (Leipzig, 6th edition).

*804. Old Provencal (Continued). Three credit hours. Spring Quarter. General prerequisites must include French 803. Mr. Schutz.

Study of the language and literature of the Troubadours; Appel's Provenzalische Chrestomathie (Leipzig, 6th edition).

811. Seminar in French Literature. Three to five credit hours. Autumn Quarter. General prerequisites must include three years of collegiate French and permission of the instructor must be obtained. Mr. Havens.

Topic: Diderot.

Given in the Summer of 1943.

812. Seminar in French Literature (Continued). Three to five credit hours. Winter Quarter. General prerequisites must include three years of collegiate French and permission of the instructor must be obtained. Mr. Demorest.

Topic: Flaubert.

813. Old French Literature. Three credit hours. Autumn Quarter. General prerequisites must include three years of collegiate French. Mr. Schutz.

Introduction to the reading of Old French. Reading and discussion of the Chanson de Roland, the Yvain of Chrêtien de Troyes, representative lyrics and the Tristan of Béroul. Lectures on the main currents of Old French Literature.

Given in the Summer of 1943.

* Not given in 1943-1944.

817. Seminar in French Literature. Three to five credit hours. Spring Quarter. General prerequisites must include three years of collegiate French and the permission of the instructor must be obtained. Mr. Moore.

Topic: Franco-Italian Conte.

880. Bibliography and Method. One credit hour. Autumn Quarter. Required of all graduate students specializing in French. Mr. Rockwood.

A course to acquaint graduate students with tools, problems and methods of linguistic and literary research.

950. Research in French Language or Literature. Autumn, Winter, and Spring Quarters. General prerequisites must include not less than four years of collegiate French and permission of the instructor must be obtained. Mr. Moore, Mr. Havens, Mr. Schutz, Mr. Demorest.

This course is designed to meet the needs of individual graduate students who are pursuing a major study in the Department of Romance Languages.

Given in the Summer of 1943.

ITALIAN

950. Research in Italian Language or Literature. Autumn and Winter Quarters. Mr. Moore.

This course is designed to meet the needs of individual graduate students who are pursuing a major study in the Department of Romance Languages.

SPANISH

805. Old Spanish. Three credit hours. Autumn Quarter. General prerequisites must include not less than three years of collegiate Spanish and permission of the instructor must be obtained. Mr. Hendrix.

Given in the Summer of 1943.

806. Old Spanish (Continued). Three credit hours. Winter Quarter. General prerequisites must include not less than three years of collegiate Spanish and permission of the instructor must be obtained. Mr. Hendrix.

815. Seminar in Spanish Literature. Three to five credit hours. Autumn, Winter, and Spring Quarters. Lectures, readings, and reports. General prerequisites must include not less than three years of collegiate Spanish and permission of the instructor must be obtained. Mr. Hendrix, Mr. Anibal.

Given in the Summer of 1943.

***821. Old Spanish Literature.** Three credit hours. General prerequisites must include not less than three years of collegiate Spanish and permission of the instructor must be obtained. Mr. Hendrix, Mr. Anibal.

Certain masterpieces of Spanish literature often not included in the usual survey courses.

880. Bibliography and Method. One credit hour. Autumn Quarter. Required of all graduate students specializing in Spanish. Mr. Anibal.

A fundamental course for graduate students in the methods and tools of linguistic and literary appreciation and research.

950. Research in Spanish Language or Literature. Autumn, Winter, and Spring Quarters. General prerequisites must include not less than three years of collegiate Spanish and permission of the instructor must be obtained. Mr. Hendrix, Mr. Anibal.

This course is designed to meet the needs of individual graduate students who are pursuing a major study in the Department of Romance Languages.

Given in the Summer of 1943.

* Not given in 1943-1944.

RURAL ECONOMICS AND RURAL SOCIOLOGY

Office, 113 Townshend Hall

PROFESSORS FALCONER, HENNING, McBRIDE, WERTZ, MANGUS, AND HAUCK, ASSISTANT PROFESSOR SITTERLEY

NOTE: For Marketing courses given in cooperation with other departments, see the following courses:

Animal Husbandry 608. Live Stock Marketing.
Animal Husbandry 626. Marketing of Dairy Products.
Horticulture 628. The Marketing of Fruits and Vegetables.
Poultry Husbandry 603. Marketing Poultry Products.

Prerequisites for Graduate Work: General prerequisites include fundamental courses in economics or sociology.

Fields of study: The areas of specialization within the department include: (1) Farm organization and management, (2) Marketing farm products, (3) Rural sociology, (4) Farm prices, land use, agricultural policy, farm taxation, farm finance.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

RURAL ECONOMICS

602. Advanced Farm Organization. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Falconer.

A more detailed and advanced consideration of the economic principles involved in farm organization. The application of these principles to current agricultural production problems.

603. Cooperation in Agriculture. Five credit hours. Winter Quarter. Five lectures each week. Mr. Henning.

A study of agricultural cooperation, mainly as found in the United States. The types of cooperative marketing, manufacturing and purchasing organizations, collective bargaining, cooperative credit and insurance.

605. The Agricultural Industry. Three credit hours. Winter Quarter. Three lectures each week. Mr. Falconer.

The importance of the agricultural industry to the welfare of the nation. Some characteristics of the farming industry. Foreign competition, present and prospective. State and federal regulation, encouragement and aid to agriculture in the United States and foreign countries.

610. Agricultural Credit. Three credit hours. Spring Quarter. Mr. Wertz.

The credit needs of agriculture and how they are met.

612. Prices of Farm Products. Three credit hours. Spring Quarter. Three lectures each week. Mr. Wertz.

A study of the prices of farm land and of farm products. Adjusting the farm business to meet price fluctuations.

613. Marketing Farm Products. Five credit hours. One Quarter. Autumn and Spring. Five lectures each week. Mr. Henning, Mr. McBride.

A study of local and terminal marketing services and agencies involved in the marketing of farm products

Given in the Summer of 1943.

614. Business Management in Agricultural Marketing. Three credit hours. Winter Quarter. Two lectures and one laboratory period each week. Given in alternate years. Mr. Henning.

A detailed study of representative agricultural marketing agencies, including their problems of administration, finance, selling, transportation and warehousing.

615. Land Economics. Three credit hours. Spring Quarter. Mr. Sitterley.

The uses and classification of rural land. The public interest in a land policy.

RURAL SOCIOLOGY

606. Rural Sociology. Five credit hours. Autumn Quarter. General prerequisites must include ten hours of general sociology. Mr. Mangus.

A general course in the sociology of rural life. Emphasizes the fundamental and conditioning factors in rural social development, rural social institutions and the nature of rural social organization.

607. Rural Social Organization. Four credit hours. Winter Quarter. General prerequisites must include ten hours of general sociology. Mr. Mangus.

An intensive course in the theory and technique of rural social organization. The characteristics of rural group life, the processes of group organization, and the conditions and factors affecting the nature, permanence and success of groups organized on a local, state, and national basis are given consideration.

608. Problems of Rural Population. Three credit hours. Autumn Quarter. General prerequisites must include ten hours of general sociology. Mr. Mangus.

A study of the changing composition, characteristics, and distribution of the population, the factors making for change, and the effects of population changes on rural social organization and disorganization.

SPECIAL PROBLEMS

RURAL ECONOMICS AND RURAL SOCIOLOGY

701. Special Problems. Three to fifteen credit hours, given in units of three or five hours a Quarter for one or more Quarters. Autumn, Winter, Spring. General prerequsites must include at least eight hours of work in the department and the consent of the instructor must be obtained. Mr. Falconer, Mr. McBride, Mr. Henning, Mr. Wertz, Mr. Sitterley, Mr. Hauck, Mr. Mangus.

This course is for students who desire to work out special problems in the field of rural economics and rural sociology.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

802. Rural Economics Seminar. One to three credit hours. Winter and Spring Quarters. Consent of the instructor must be obtained. Mr. Falconer.

950. Research in Rural Economics. Autumn, Winter, and Spring Quarters. Opportunity is offered to carry on special research in agricultural economics and rural sociology. Mr. Falconer, Mr. Henning, Mr. McBride, Mr. Wertz, Mr. Mangus, Mr. Hauck.

Given in the Summer of 1943.

SCHOOL ADMINISTRATION

(See Education)

SOCIAL ADMINISTRATION

Office, 303 Social Administration Building

PROFESSORS STILLMAN, HAGERTY (EMERITUS), MARK, PATERSON, RECKLESS, AND CLOPPER, ASSISTANT PROFESSORS BATCHELOR AND REIMERS, ASSISTANT PROFESSORS JONES AND BLACKBURN, MR. CORNELL, AND SPECIAL LECTURERS

GRADUATE CURRICULA IN SOCIAL ADMINISTRATION

The graduate curricula in Social Administration are designed to prepare students for professional positions in various fields of social work including community organization, social case work, group work and recreation, penology and corrections, and social research.

The School offers the degrees of Master of Arts in Social Administration and Master of Arts.

The Master of Arts in Social Administration is the professional social work degree, involving six full Quarters and all basic courses in accordance with the requirements of the American Association of Schools of Social Work. It qualifies the holder for immediate membership in the American Association of Social Workers.

The Master of Arts degree normally involves four Quarters, one of which must be field work. It is not designed to meet technical and time requirements as in the case of the Master of Arts in Social Administration.

The School offers, also, the Doctor of Philosophy degree which meets all basic professional requirements as in the case of the Master of Arts in Social Administration. Either of the above two degrees counts as one year toward the Ph.D. degree.

Social Administration 875 and 950 are open only to graduate students in the School of Social Administration.

Students desiring to become candidates for the Master of Arts degree in Social Administration should have at least thirty Quarter hours of work in the social and biological sciences. These thirty Quarter hours must be selected from at least two different fields. Students having only minor deficiencies in meeting this requirement may be admitted to graduate work to be applied toward the degree on condition that such courses, as will meet the deficiency, be taken as soon as practicable and without credit toward the degree.

Although the programs here described refer to those specializing in Social Administration, the courses are adapted to the needs of other students.

GENERAL REQUIRED COURSES

All candidates for the degree of Master of Arts in Social Administration must take Social Administration 845 and 846 (or have had their equivalents), 875 and 950. Students must meet all the requirements of the Graduate School including an acceptable thesis, the preparation of which is under the specific direction of a member of the faculty of the School of Social Administration.

The program of study for each student (in addition to the general required courses listed above) will be arranged with the assistance and approval of his faculty adviser and of the Director of the School, according to the particular field of social work in which the student desires to specialize and with proper consideration of recognized requirements for professional training in social work.

For detailed information concerning fields of specialization see the Bulletin of the School of Social Administration.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

618. The Field of Social Work. Four credit hours. One Quarter. Autumn and Spring. Mr. Clopper.

A survey of contemporary social work by functional groupings of services such as social case work, group work and community organization. Emphasis on the objectives, processes and personnel requirements in each functional grouping. Consideration also given to the relationship of social work to other social developments and social forces, current and historical.

Not open to students who have credit for Social Administration 676.

621. Elementary Principles of Probation and Parole. Three credit hours. Winter Quarter. General prerequisites must include Sociology 625. Mr. Reckless.

A study of how offenders are placed and supervised on probation and parole.

626. Penology. Three credit hours. Autumn Quarter. General prerequisites must include Sociology 625. Mr. Reckless.

The handling and treatment of adult offenders by courts, jails, reformatories, prisons, probation, and parole.

627. Juvenile Delinquency and Its Treatment. Three credit hours. Winter Quarter. Mr. Reckless.

Juvenile delinquency as a social problem. Methods of treatment and prevention, including juvenile courts, clinics, probation, parole, correctional institutions, child placement, and recreational programs.

630. The Service Man and His Family. Three credit hours. Winter Quarter. Mr. Clopper.

A study of the social services given to the service man and his family. Special attention to soldiers allotments and allowances, disability compensation, care of children of working mothers, and social protection; and to agencies such as the American Red Cross, U.S.O., and O.C.D. Volunteer Services, and W.P.A. nursery program. Basic principles and methods of social welfare applied to these services.

Given in the Summer of 1943.

635. The Social Work Approach to Life Adjustments. Three credit hours. One Quarter. Autumn and Spring. Desirable prerequisites, Psychology 609 or 641. Mr. Reimers.

The social work approach in assisting individuals to remove or surmount barriers in growth toward, or a maintenance of, life adjustments which are personally satisfying and socially useful.

638. Field Methods in Social Investigation. Five credit hours. One Quarter. Autumn and Spring. Three class meetings and four hours in field or laboratory each week. Miss Mark, Mr. Blackburn, Mr. Cornell.

Statistical investigation of some phase of social life of the city. Drafting and using of schedules. The statistical interview. Editorial processes. Drafting of tables. Tabulation.

639. Social Statistics. Five credit hours. One Quarter. Winter and Spring. Three class meetings and two two-hour laboratory periods each week. Miss Mark, Mr. Blackburn, Mr. Cornell.

The interpretation of statistical data. Averages and ratios, measures of dispersion, graphic presentation, statistical text. A study of the fields of population and vital statistics, statistics of dependency, delinquency, and standard of living.

Given in the Summer of 1943.

640. Social Statistics. Three credit hours. Spring Quarter. Two class meetings and one two-hour laboratory period each week. General prerequisites must include Social Administration 639. Miss Mark, Mr. Blackburn, Mr. Cornell.

Interpretation of social data with special attention to the fields of dependency, delinquency, and standard of living. Index numbers, correlation, sampling. Special analysis using standard electrical tabulating equipment.

642. Case Recording and Office Procedures. Three credit hours. One Quarter. Winter and Spring. Miss Jones.

A study of case history writing, correspondence, case accounting and other office procedures common in public assistance agencies.

646. Group Work and Recreational Agencies. Four credit hours. Winter Quarter. Mr. Batchelor.

A study of the group work and recreational resources of the community; public and semi-public. Consideration of the principles and objectives of group work and of community recreation. The place of commercialized recreation in American cities and towns; legislative and other controls.

Given in the Summer of 1943.

647. Leadership and Direction of Group Activities. Three credit hours. Autumn Quarter. Lectures, readings, practical demonstrations, field work. Sociology 645 is strongly recommended as a preliminary or concurrent course. Mr. Batchelor.

Consideration of problems of leadership and practice in methods of directing of boys' and girls' clubs and adult leisure groups. The use of active and quiet games, stories, music, dramatics, folk recreation, and crafts, including demonstrations, field trips, field practices, and instruction in the various techniques

Given in the Summer of 1943.

648. Organization and Direction of Specialized Group Activities. Three credit hours. Spring Quarter. Lectures, readings, demonstrations, and field

observation. General prerequisites must include Sociology 645 and Social Administration 646 and open to others with consent of the instructor. Mr. Batchelor.

Consideration of various forms of special group agency programs such as vacation schools as conducted by social settlements and churches, leadership training courses, camps and institutes. Particular attention is given to the adaptation of these to the national programs of the Y.M.C.A., Y.W.C.A., Boy Scouts, Girl Scouts, and Camp Fire Girls.

650. Contemporary Group Work Methods. Five credit hours. Spring Quarter. General prerequisites must include Sociology 645 and Social Administration 646. Mr. Batchelor.

An analysis of the basic philosophy of social group work and its practical application in group leadership. Consideration of the organization and methods of the principal agencies in this field such as settlements, the Y.M.C.A., the Y.W.C.A., Boy Scouts, Girl Scouts, and Camp Fire Girls. Specialists from these various agencies will assist in the instruction.

652. Supervisory Problems in Group Work. Three credit hours. Spring Quarter. General prerequisites must include Sociology 645 and Social Administration 646 and 675 or the equivalents, or permission of the instructor. Mr. Batchelor.

Supervisory and departmental practices in the settlement, Y.M.C.A., Y.W.C.A., Boy and Girl Scouts, Camp Fire Girls, and similar organizations. Consideration of methods of recruiting, selection, training, supervision, and guidance of professional and volunteer personnel.

660. Public Assistance Services. Three credit hours. Winter Quarter. Mr. Clopper.

A study of the various public assistance programs including Aid for the Aged, Aid to the Blind, Aid to Dependent Children and General Relief, and the general principles underlying them, the methods by which they are administered with particular attention to the role of the case worker in each of these programs.

Given in the Summer of 1943.

668. Community Organization Resources. Four credit hours. Spring Quarter. Four class meetings each week. Mr. Clopper.

An analysis of the various types of social work resources commonly comprising a community's total welfare facilities with special attention to the functional interrelationships of agencies.

670-†671. Community Health Organization. Three credit hours. Two Quarters. 670, Winter; 671, Summer. Mr. Paterson.

The aims and historical developments of public health, with particular reference to England and the United States of America.

Given in the Summer of 1943.

679. Legal Aspects of Social Work. Three credit hours. One Quarter. Autumn and Winter. Mr. Clopper.

Discussion of the law as a means of social control; study of case law and statutes relating to those fields of the law which are of greatest concern to the social worker; the legal aid movement in the United States.

Given in the Summer of 1943.

695. The Public Assistance Worker. Five credit hours. One Quarter. Autumn and Winter. Miss Jones.

An introductory course in public assistance. Client participation. Eligibility for aid. Determination of assistance in relation to client's specific needs and agency's policies.

Not open to students who have credit for Social Administration 695.

Given in the Summer of 1943.

696. Case Studies in Public Assistance. Five credit hours. One Quarter. Winter and Spring. General prerequisites must include Social Administration 695. Miss Jones.

A critical analysis of representative public assistance cases with particular emphasis on budgeting and the practical interpretation of agency policies.

Not open to graduate students majoring in case work.

† Not given during the academic year, 1943-1944.

700. Special Problems. One to five credit hours. All Quarter. Permission of instructor must be obtained.

Individual study in some field of social interest. For problems in social statistics, training in the use of standard electrical tabulating equipment is given. Special opportunities are offered for study in the field of public housing.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

813. The Community Chest Movement. Four credit hours. Autumn Quarter. Open by consent of the instructor. Mr. Stillman.

Origin, development and present status. The business end of a Community Chest and its place in the field of welfare finance. Study of and report upon the Columbus Community Fund campaign for funds. Analysis of paper organizations of Community Chests of other cities.

814. Contemporary Social Work. Four credit hours. Winter Quarter. General prerequisites must include Social Administration 813. Open by consent of the instructor. Mr. Stillman.

An analysis of programs as actually operative in American communities. Methods of coordination in social work. The Community Chest and Councils of Social Agencies. Making a community program. Functional groupings in the field of social work.

†815. Interpretation of Social Work. Four credit hours. General prerequisites must include Social Administration 813 and 814. Open by consent of the instructor. Mr. Stillman.

The place of education in a social work program. The message and the method of educational publicity.

Given in the Summer of 1943.

816-817. Social Case Work. Four credit hours. 816, Autumn and Spring Quarters; 817, Winter Quarter. Mr. Reimers.

The principles and methods of social case work and their application; case records used for study and discussion.

Given in the Summer of 1943.

818. Advanced Case Work. Four credit hours. One Quarter. Autumn and Spring. General prerequisites must include Social Administration 816 and 817 All registrations require the approval of the instructor. Mr. Reimers.

Application of case work to the treatment of individuals with behavior difficulties. Formulation of treatment plans. Case materials extensively used.

Not open to students who have credit for Social Administration 860.

819. Case Work Treatment. Four credit hours. Winter Quarter. General prerequisites must include Social Administration 878. Mr. Reimers.

Consideration of some basic factors involved in the carrying out of case work treatment plans. Deals with the differential coordination in each case of the client's needs, the case worker's abilities, and her agency's limitations. Case material extensively used.

Not open to students who have credit for Social Administration 861.

***820. Interviewing in Social Case Work.** Three credit hours. Spring Quarter. General prerequisites must include Social Administration 818. Mr. Reimers.

A course to assist the student in acquiring facility in interviewing. Attention is directed toward understanding the caseworker-client relationship and toward appreciating the variables entering into interviews.

Not open to students who have credit for Social Administration 839.

821. Community Planning for Child Care. Three credit hours. Autumn Quarter. Mr. Clopper.

Critical examination of child care programs, including both voluntary and governmental agencies. The place of such programs in a community welfare scheme as affected by state control or regulation. Influence of state regulations in developing standards of care in relation to children in their own homes, in institutions, or in foster homes.

Not open to students who have credit for Social Administration 620.

† Not given during the academic year, 1943-1944.

* Not given in 1943-1944.

823. Substitute Parental Care. Three credit hours. Winter Quarter. General prerequisites must include Social Administration 816, 620 or 821 and 673 or 827. Miss Wisgerhof.

Consideration of the principles and methods of foster home placement including determination of need for placement, preparation and participation of child and parents, selection of substitute parents or institution, and follow-up. Basic case work concepts are applied to this specialized setting.

825. Medical Aspects of Social Work. Three credit hours. Winter Quarter.

Presentation of technical knowledge about diseases, especially those with definite social implications. Signs, symptoms, etiology of common diseases. The responsibility of the social worker in detecting and reporting disease, and in organizing medical care as a resource in social treatment. Cooperation of the social worker with the physician and with medical and public health agencies.

827. Psychiatric Aspects of Social Work. Three credit hours. One Quarter. Autumn and Spring. Mr. Reimers.

The influence of modern psychiatry upon social work practice. Attention appropriate to the social worker is given to the development and functioning of emotional life and to the dynamics of behavior.

Not open to students who have credit for Social Administration 673.

830. Community Organization Processes. Three credit hours. Winter Quarter. Mr. Clopper.

A study of the methods by which a social worker may assist in developing and maintaining his agency's service in the community and by which he may play a significant part in developing a progressive social program in the community. Attention given to methods for analyzing community needs, to the problem of inter-relating agencies, both public and private, in meeting these needs, and to the securing of community interest in and understanding of social work.

Given in the Summer of 1943.

835. The Social Worker and Community Groups. Three credit hours. Autumn Quarter. Open by consent of the instructor. Mr. Stillman.

The social work executive as a specialist in the field of community planning.

836. National Social Work Agencies and Local Programs. Three credit hours. Winter Quarter. General prerequisites must include Social Administration 813. Open by consent of the instructor. Mr. Stillman.

Their historical development and influence. Contractual relations. Promotion. Education. Specialism. Standards.

†837. Budgeting Community Social Work. Three credit hours. General prerequisites must include Social Administration 813 and 814. Open by consent of the instructor. Mr. Stillman.

Principles and methods of budgeting. The budget in relation to money raising and social planning.

Given in the Summer of 1943.

840. Probation and Parole. Three credit hours. Spring Quarter. General prerequisites must include two courses in criminology. Mr. Reckless.

The individual treatment of the delinquent. The organization of probation and parole. The probation and parole systems of the different states. A critical analysis of the methods of probation and parole.

841. Public Welfare Administration. Three credit hours. Spring Quarter. Mr. Clopper.

Principles in the administration of welfare activities by departments of government, local, state and federal. Emphasis on administrative problems of personnel, finance, public relations and social planning in relation to family welfare and child care.

Given in the Summer of 1943.

843. The Administration of Social Work Agencies. Three credit hours. Spring Quarter. Mr. Clopper.

An introduction to the basic factors in the administration of social agencies.

845-846. Methods of Social Investigation. Four credit hours. Autumn and Winter Quarters. Required of candidates for advanced degrees in social administration who have not had equivalent work. Miss Mark, Mr. Blackburn.

A course designed to prepare students to do independent social research involving the

† Not given during the academic year, 1943-1944.

simpler statistical methods. Students will undertake a class project involving the collection of data and analysis of the results.

847-848-849. Research in Penology. One to four credit hours. Autumn, Winter, and Spring Quarters. Open on consent of the instructor. It is assumed that the student who takes this course shall have had one year's work in criminology and penology. Mr. Reckless.

853. Administrative Relationships in Group Work. Three credit hours. Winter Quarter. Mr. Batchelor.

A study of methods of coordination of voluntary group work agencies with public education and public recreation agencies. Consideration of the elements involved in the correlation of various units functioning within each of these three fields.

855. Public Recreation: Its Organization and Administration. Three credit hours. Winter Quarter. Mr. Batchelor.

Consideration of public provision for the use of leisure with particular reference to methods of organization and administration of playgrounds, community centers and school centers.

Given in the Summer of 1943.

857. Administration of Statistical Projects. Three to five credit hours. Autumn Quarter. General prerequisites must include Social Administration 845-846 or equivalent. Miss Mark.

The principles and methods of administration. Organization of office and field work, standards of personnel, methods of control, budgetary problems. Students will participate in supervision of a project.

858-859. Planning Statistical Studies. One to three credit hours. Winter and Spring Quarters. General prerequisites must include Social Administration 845-846 or equivalent. Miss Mark.

Analysis of selected subjects for field investigation. Delimitation of inquiry; determination of sampling method; drafting of outline of report, skeleton tables, schedule and instructions or questionnaire, coding system and punch card for use in tabulating data on standard electrical tabulating equipment.

862. Psychiatric Applications in Social Work. Three credit hours. Winter Quarter. General prerequisites must include Social Administration 673 or 827. Mr. Reimers.

Application of the principles presented in Social Administration 673 to several varieties of individual social maladjustment commonly encountered in social work practice. Special attention to the emotional content of maladjustment with regard to marriage and parenthood, economic self-maintenance, and physical health.

875. Field Work. One to fifteen credit hours. Summer, Autumn, Winter, and Spring Quarters. Open only to graduate students in Social Administration. Each field placement must be arranged in consultation with student's faculty adviser.

Practical work in the various areas of social administration under the supervision of the organization in these areas and the instructors.

Given in the Summer of 1943.

876. Administration of Correctional Institutions. Three credit hours. Winter Quarter. General prerequisites must include Social Administration 626 or 627 or permission of the instructor. Mr. Reckless.

The organization and management of various types of correctional institutions. Attention to problems of program, personnel, intake, classification, and release.

877. The Function and Operation of Public Institutions. Three credit hours. Autumn Quarter. Mr. Reckless.

Growth and expansion of public institutions. Composition of institutional population. Analysis of programs. Problems of personnel and management. The impact and results of institutional care.

950. Research in Social Administration. Autumn, Winter, and Spring Quarters. All instructors.

Individual projects selected and prosecuted in consultation with the instructor.

Given in the Summer of 1943.

SOCIOLOGY

Office, 111 Commerce Building

PROFESSORS DENUNE, LUMLEY, NORTH, MARK, AND RECKLESS, ASSOCIATE PROFESSORS BATCHELOR AND COOK, ASSISTANT PROFESSOR HARRIS, MISS GREENHOE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

600. The Modern Family. Four credit hours. One Quarter. Autumn, Winter, Spring. Mr. Denune.

An examination of the results of the impact of modern culture upon the family with special reference to such factors as size of family, member relationships, economic problems, divorce, desertion, status of women.

601. Types of Family Organization. Four credit hours. Spring Quarter. Mr. Lumley.

A survey of family organization from primitive times to the present; an analysis of the factors that entered into their development.

Given in the Summer of 1943.

604. Race Problems. Three credit hours. Autumn Quarter. Mr. Cook.

Contemporary adjustment problems of Negro, immigrant, and Jew. Racial and national differences, population shifts, economic adjustments, health, family life, citizenship, leisure pursuits, religion, and education.

Not open to students who have credit for Sociology 608.

605. Race Relations. Three credit hours. Winter Quarter. Mr. Cook.

A study of majority and minority group relations, ideology of race, interracial conflicts, institutional changes, personality disorganization, planned assimilation, acculturation as a natural process.

607. Race Contacts and Culture Conflicts. Four credit hours. Spring Quarter. Mr. Harris.

Problems arising from contact of culture, with particular attention to the acculturation of preliterate peoples by European civilization.

610. The Standard of Living. Four credit hours. Spring Quarter. Four class meetings each week. Miss Mark.

A consideration of the content of the various standards of living in American society, their economic and social significance. Problems in family budget and retail buying.

612. Primitive Social Organization. Three credit hours. Autumn Quarter. Three class meetings each week. Mr. Harris.

The course provides a familiarity with the principles of sociology which govern social relationships of certain of the simpler societies.

613. Primitive Religion. Three credit hours. Winter Quarter. Consent of the instructor must be obtained. Mr. Harris.

An examination of the fundamental religious beliefs and practices of primitive peoples.

***614. Social Ecology.** Four credit hours.

Population patterns and changes, ecological processes, institutional organization and disorganization, community zones, sub-areas and their social characteristics.

618. Social Problems of Low Income Groups. Three credit hours. Winter Quarter.

Extent, nature and casual factors in poverty. Present problems of low income groups. Relief and philanthropic programs. Social Security in relation to American standards of living and the prevention of poverty.

622. Human Nature and Social Adjustment. Three credit hours. Winter Quarter. Miss Greenhoe.

Nature of human nature; process of socialization; social change and individual demoralization; social roles in conflict situations; re-direction of social activity.

Given in the Summer of 1943.

* Not given in 1943-1944.

623. Collective Social Behavior. Three credit hours. Spring Quarter. Mr. Cook.

A study of the kinds of mass action arising in crowds, mobs, strikes, audiences and publics. Problems and techniques of study and control.

Given in the Summer of 1943.

625. Criminology. Three credit hours. One Quarter. Autumn and Spring. Mr. Reckless.

The nature, variation and causes of crime and delinquency. Studies of criminal liability, criminal careers, and organized crime and racketeering.

629. General Sociology. Four credit hours. Autumn Quarter. General prerequisites must include thirty hours in not more than two allied subjects. Mr. North.

A critical examination of the more fundamental ideas and concepts of modern scientific sociology.

Given in the Summer of 1943.

***630. Indians of North America.** Three credit hours. Autumn Quarter. Alternate with Sociology 612. Mr. Harris.

A survey of the aboriginal peoples and cultures of North America from the earliest times to the present. Special attention is given to the tribes of Ohio. Slides, motion pictures, and study of the Ohio State Museum collections supplement the programs of classroom study.

***631. Indians of Central and South America.** Three credit hours. Winter Quarter. Alternate with Sociology 613. Mr. Harris.

A survey of the races and tribes of Central and South America from the earliest times to the present. Special attention will be given to the contemporary Indian and mixed populations. Slides, motion pictures, and museum study will supplement the classroom work.

645. Leisure and Recreation. Four credit hours. One Quarter. Autumn and Spring. Mr. Batchelor.

The sources of leisure in early and modern society. The social significance and uses of leisure. The social functions of play. Historical aspects of play. The recreation problem of modern communities from the standpoint of control and of public provision.

Given in the Summer of 1943.

656. Rural Social Institutions. Four credit hours. Autumn Quarter. Mr. Denune.

The problems of health, recreation, social intercourse, housing, child welfare, dependency, defectiveness, and delinquency in American rural communities and small towns. The agencies and organizations dealing with these problems.

665. Propaganda and Social Control. Three credit hours. Autumn Quarter. Mr. Lumley.

The nature, methods and extent of propaganda, scientific information, rewards, punishment and other means of social control.

Given in the Summer of 1943.

***666. Social and Cultural Change.** Three credit hours. Winter Quarter. Given in alternate years. Mr. Lumley.

The changing social scene; conflicting attitudes towards social and cultural change; various supposed determinisms; possible laws of change; the question of cycles; various methods of change; the measurement of change.

667. Social Progress. Three credit hours. Spring Quarter. Textbooks, lectures, papers, and discussions. Mr. Lumley.

A study of the various theories and the criteria of social progress. Extra readings for graduate credit.

***674. Archaeological Training Expedition.** Eight credit hours. Full time in expedition camp. General prerequisites must include courses in anthropology and archaeology. Mr. Morgan and Museum staff.

Qualified students registering for this course will join the joint expedition of the Ohio State University and the Ohio State Museum, which will be engaged in excavating prehistoric sites in Ohio. Instruction and experience will be provided in every phase of archaeological field work. Prospective students should consult Mr. Morgan.

* Not given in 1943-1944.

676. Social Classes. Four credit hours. Winter Quarter. Four class meetings each week. Mr. North.

Class distinctions as a phase of social differentiation. The origin and characteristics of social classes. The significance for modern society of class consciousness, class struggle, and social mobility.

677. Social Organization in a Changing World. Four credit hours. Spring Quarter. Four class meetings each week. Mr. North.

An examination of the adaptability of present institutional organization to the situation created by world reorganization. The impact of world problems upon American culture. Implications of democracy for social reconstruction.
Given in the Summer of 1943.

678. Community Action and the School. Three credit hours. Autumn Quarter. Mr. Cook.

Nature and integration of the American Community; structure, processes, leadership of local social action groups; the participation of school personnel in cooperative efforts to solve local and regional problems.

680. Social Orientation of Children. Four credit hours. Autumn Quarter. Three class sessions each week and one hour for field study of a child group. Mr. Cook.

A study of the ways in which society socializes children, with parallels from more stable or less complex cultures. Current breakdowns in the socializing process and implications from the school and other educational agencies.
Given in the Summer of 1943.

700. Special Problems. One to four credit hours. Autumn, Winter, and Spring Quarters.

Individual study in some field of social interest.
Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

All candidates for degrees are required to register for Sociology 800 or Social Administration 845-846.

800. Introduction to Sociological Research. Four credit hours. Autumn Quarter. General prerequisites must include a course in elementary social studies. Mr. Reckless.

Delineation of a research problem in sociology. Uses of available sources of data. Sampling procedures of sociological research. Field methods for collecting original data. Sociometric instruments.

***801-*802-*803. History of Sociological Thought.** Two credit hours. Autumn, Winter, and Spring Quarters. One session each week. Readings, reports, lectures, and discussions. Given in alternate years. Mr. Lumley.

A survey of the most important literature representing the development of European sociology.

805-806-807. American Sociological Theory. Two credit hours. Autumn, Winter, and Spring Quarters. One session each week. Readings, reports, lectures, and discussions. Given in alternate years. Mr. Lumley.

An intensive study of the theories concerning the origin, development, forms and nature of society, advanced by the leading American sociologists.
Sociology 805 given in the Summer of 1943.

820. Seminar in Anthropology. Two credit hours. Autumn, Winter, and Spring Quarters. Mr. Harris.

***827. Nationality and Nationalism.** Four credit hours. Autumn Quarter.

A survey of the religious, economic, political, and social backgrounds which underlie the contemporary development of national attitudes.

* Not given in 1943-1944.

*862-*863. **Social Planning and Reconstruction.** Four credit hours. Autumn and Winter Quarters. Mr. North.

An examination of the nature of the problems and methods involved in efforts to effect purposive change. The methods and agencies of change. Gradualism and Revolution as modes of social reconstruction. The place of values in choosing goals of social effort. Critical examination of the more prominent efforts at social planning now in progress in America and elsewhere.

Not open to students who have credit for Sociology 860.

864. **Advanced Criminology.** Four credit hours. Spring Quarter. General prerequisites must include Sociology 625 or its equivalent. Given in alternate years. Mr. Reckless.

Intensive study of the most important aspects of criminology.

890. **Methodology in Sociological Research.** Four credit hours. Spring Quarter. General prerequisites must include Sociology 800 and Social Administration 846 or their equivalents. Given in alternate years. Mr. Reckless.

A critical evaluation of social surveys, areal and regional studies, the ecological approach, sociometric studies, prediction of outcome, and case study methods.

900. **Seminar in Sociology.** One to four credit hours. One seminar each Quarter. Autumn, Propaganda Analysis, Mr. Lumley; Winter, Field and Methods of Educational Sociology, Mr. Cook; Spring, Social Organization, Mr. North.

Given in the Summer of 1943.

950. **Research in Sociology.** Autumn, Winter, and Spring Quarters.

Individual projects selected and prosecuted in consultation with the instructor.

(a) Social Organization; Social Movements. Mr. North.
(b) Modern Sociological Theory. Mr. North.
(c) History of Sociological Thought. Mr. Lumley.
(d) Social Control. Mr. Lumley.
(e) The Family. Mr. Denune.
(f) Criminology. Mr. Reckless.
(g) School and Community Relations. Mr. Cook.
(h) Race Relations. Mr. Cook.
(i) Anthropology. Mr. Harris.
(j) Leisure and Recreation. Mr. Batchelor.
(k) Rural Social Institutions. Mr. Denune.

Given in the Summer of 1943.

SOILS

(See Agronomy)

SPANISH

(See Romance Languages and Literatures)

SPECIAL EDUCATION

(See Bureau of Special and Adult Education)

* Not given in 1943-1944.

SPEECH

Office, 113 Derby Hall

PROFESSORS KETCHAM AND WILEY, ASSISTANT PROFESSORS MASON, BAHN, EMSLEY, MOSES, TIMMONS, AND EMERY

Prerequisites for Graduate Work: The completion of a strong undergraduate major in speech or its equivalent is a prerequisite for graduate work. Students who cannot meet this requirement immediately are advised to register as "Special Students" until it is completed. This requirement may be tested by either written or oral qualifying examinations. Each student must be able to write and to speak with reasonable clarity and good usage. Deficiencies must be made up to the satisfaction of the departmental graduate committee.

Requirements for Master's and Ph.D. Degrees: Candidates for the Master's Degree or for the Ph.D. degree are held responsible for a general understanding of speech bibliography and methods of research in speech and a thorough working knowledge of the bibliography and research methods appropriate to the thesis or dissertation. All Ph.D. candidates must show a general understanding of: (1) related studies in other University departments; (2) history and theories of rhetoric, rhetorical criticism, and public address; (3) history and theories of the theater, dramatic criticism, and oral interpretations; (4) speech correction, experimental phonetics and linguistic phonetics. Candidates for the Master's degree are held responsible for a general understanding of two of these four items.

Exceptions to these general requirements can be made only when a greater degree of specialization is justified.

Candidates for either the Master's or the Ph.D. degree must select from the following fields of concentration or specialization: (1) rhetoric and public address; (2) dramatics and oral interpretation; (3) phonetics and speech correction. Regardless of the field of concentration, Ph.D. candidates are required, and Masters' candidates are strongly advised, to have a general understanding of related content in other University departments.

Departmental Committee on Graduate Work: The administration of most of these requirements, especially those for specialization, will rest with the student's advisory and dissertation committees. All general requirements which are in addition to those of the Graduate School are administered by the Graduate Committee of the Department of Speech. The advisory committee and the program of the Ph.D. student in speech are subject to approval by the Graduate School. Such program must be submitted for approval not later than the middle of the second Quarter after the candidate is registered for the Ph.D. degree.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

University requirements for any of the courses in this group specify a prerequisite of either (a) thirty Quarter hours in not more than two allied subjects, or (b) ten hours in such allied subjects and ten hours in Speech.

601. The Forms of Public Address. Five credit hours. Spring Quarter. Mr. Ketcham.

A study of special methods by which speech is made clear, interesting, and forceful. Practice in using these methods in the preparation and delivery of the different forms of public address, including nominating, dedicatory, eulogistic, after dinner, and general academic, political, and business speeches. A broad view of language training is given with the object of increasing the student's command of thought in writing and talking as well as in public speaking.

618. Historical American Phonetics. Three credit hours. Autumn Quarter. Three recitations each week. Permission of the instructor is required. Given in alternate years. Mr. Emsley.

General American pronunciation is studied in its historical background, and in comparison with eastern American, southern American, and accepted standard British. The alphabet of the International Phonetic Association, dictionaries, and records are used. Laboratory practice includes special work with dialects for use in dramatics or linguistic studies.

Given in the Summer of 1943.

630. General History of Speech and Rhetoric. Three credit hours. Autumn Quarter. Mr. Wiley.

Historical development of speech designed to give the student a substantial background for the understanding of oral language problems. Medieval and ancient rhetoric surveyed in relation to present problems in public address. Though mainly concerned with speech content, composition, and style, the course will also review the theory and practice of speech presentation, particularly in recent periods.

*633. **History of the Theatre.** Three credit hours. Autumn Quarter. General prerequisites must include a course in Shakespeare. English 670 is also recommended. Mr. Bahn.

A history of the non-literary aspects of the theater to 1880 including acting, staging and theater structure, in relation to the form of the written play.

635. **Dramatic Criticism.** Three credit hours. Winter Quarter. English 669, 670, or 676 must be included in the general prerequisites or taken concurrently. Given in alternate years. Mr. Bahn.

The development of the theory of dramatic technique in Europe from Aristotle to the present time as seen in the writings of playwrights and in criticisms of their work.

637. **Playwriting.** Five credit hours. Winter Quarter. English 669, 670 or 676 must be included in the general prerequisites or taken concurrently. Given in alternate years. Mr. Timmons.

Lectures and progressive exercises in dramatic technique. Particular attention to the one-act play. Opportunity for the projection of successful scripts under supervision of the author.

642. **Stagecraft III.** Three credit hours. Spring Quarter. Two hours lecture and two hours laboratory each week. General prerequisites must include Speech 633. Mr. Bahn.

Theories, problems and studies in stagecraft. Emphasis on research in the American and Continental Theater since 1880. Detailed study of outstanding theories and their practical application.

645. **Stage Direction I.** Three credit hours. Autumn Quarter. Two hours lecture and two hours laboratory each week. English 670 must be included in the general prerequisites or taken concurrently. Mr. Timmons.

Study and practice in the fundamentals of stage direction. Aesthetic distance, unity, emphasis, rhythm, tempo, balance, stage business and interpretation of lines are considered. The class members direct short scenes.

Given in the Summer of 1943.

646. **Stage Direction II.** Three credit hours. Winter Quarter. Two hours lecture and two hours laboratory each week. General prerequisites must include Speech 645. Mr. Timmons.

Preparing the public performance; script, selection, casting, the rehearsal schedule, the textual study of the script, the director's problems at each stage of the rehearsal process. Each student will prepare a detailed textual study and will direct the production of an edited full-length contemporary play.

647. **Stage Direction II.** Three credit hours. Spring Quarter. Two hours lecture and two hours laboratory each week. General prerequisites must include Speech 646 and 633. Mr. Bahn.

Preparing the public performance; the relationship of direction to other theatrical work; types of stage direction according to relationship between director and actor and according to style of direction; directing the historical play. Each student will prepare a detailed textual study and will direct the production of an edited, full-length historical play.

656. **Visual Hearing Techniques.** Five credit hours. Autumn Quarter. Miss Mason.

Speech and hearing problems. A course designed to assist teachers, clinical psychologists, nurses, and medical students to better understand the speech and hearing needs of the deaf and hard of hearing cases referred to them. Clinical and laboratory practice afforded those interested in the practical applications of methods and technical procedures.

657. **Hearing and Speech.** Five credit hours. Spring Quarter. Conferences, readings, discussions, demonstrations. Speech 692 or 694 and 656 must be included in the general prerequisites or taken concurrently. Special permission of instructor to students with required background in allied fields. Miss Mason.

A consideration of hearing with respect to its effect on speech. Examination of researches in otology, medicine, audiometry, acoustics, residual hearing. Visual-hearing and speech rehabilitation. Clinical and laboratory experience.

* Not given in 1943-1944.

692. Clinical Practice in Speech Correction. Five credit hours. Winter Quarter. Mr. Emsley.

Actual clinical practice in speech correction and training of visual hearing. The student will be given opportunity to study and work with a wide range of speech and hearing cases at the Children's Hospital, in the University Clinic, the Freshman Week Health Line. To make arrangements he should, therefore, if possible communicate with the department well before the opening of the Quarter.

694. Speech Disorders Survey. Five credit hours. Autumn Quarter. General prerequisites must include course credit equivalent to a major in speech or allied departments, and a background satisfactory to the instructor. Miss Mason.

This course is designed to serve the needs of those concerned solely with minor speech correction, such as those entering the field of special education, or college, high school, and elementary school teaching. It will deal primarily with phonetic substitutions; foreign accent; lisping; nasal, strident, harsh, and muffled voices; work with the deaf and hard of hearing; and other similar speech, voice, and hearing deviations from the cultured social norm.

700. Minor Problems in Speech. Three to fifteen credit hours. Autumn, Winter, and Spring Quarters. Conference, library, and laboratory work. General prerequisites must include satisfactory courses in the field of the problem undertaken. A student may repeat this course and may spend all or any part of his time on it during the Quarter. Departmental staff.

This course is designed to permit any properly qualified person to avail himself of the library and laboratory facilities of the department for carrying out a minor or preliminary investigation or for adding to his knowledge and technique in some Speech subject.

The student may exercise entire freedom in his choice of instructor to conduct his work in this course.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

*811. Survey of Experimental Techniques. Five credit hours. Autumn Quarter. Mr. Emsley.

This course is intended to give the advanced student in speech science, information and practice in carrying through precise research techniques of varying kinds, with a view to their application in the problem he proposes to undertake. It will involve the use of mechanical, electrical, photographic, acoustic, and other precision apparatus and techniques as applied to speech.

816. Speech Pathology. Five credit hours. Spring Quarter. General prerequisites must include Speech 692 and courses in allied fields satisfactory to the instructor. Miss Mason.

The serious and major speech impairments, traceable specifically to disease, mental inhibition, neuroses, psychoses, physiological mal-development or impeding growths, traumatic interference, etc. Stuttering and stammering, aphasia, aphonia, cleft-palate speech, disturbances traceable to mental retardation, auditory asthenia of varying kinds, spastic speech, etc. Types, degrees, causes, and consequences. Techniques of training involved.

824. Pronunciation Norms. Five credit hours. Winter Quarter. General prerequisites must include ten hours in speech and ten hours in the English department satisfactory to the instructor. Mr. Emsley.

The norms of cultured American speech, deviations therefrom, and their historical origin. Methods of recording and analyzing the same. Field work and laboratory practice.

844. Theatrical Art. Five credit hours. Winter Quarter. One two-hour session each week. Mr. Bahn.

The subject for each Quarter will be announced in advance.

*850. The Little Theatre. Five credit hours. Winter Quarter. One two-hour session each week. Mr. Bahn.

The course has two phases: (1) A general analysis of little theatre and community theatre organization and management. (2) An intensive study by each student of the history, organization, and special problems of a selected little theatre.

* Not given in 1943-1944.

870. Studies in Ancient and Modern Rhetoric. Three credit hours. Winter Quarter. Mr. Wiley.

An historical survey of rhetorical theory from the fifth century B. C. to the present time. Special emphasis will be laid upon general trends in rhetorical theory as a background for the understanding of modern concepts of rhetoric. Consideration also will be given to the application of rhetorical theory to the critical analysis of classical and modern examples of great public addresses.

Given in the Summer of 1943.

881-882-883. Studies in the Nature and Structure of Oral Words. Two credit hours. Autumn, Winter, and Spring Quarters. Students who enroll in 881 are expected to complete the sequence. Each course is a prerequisite to the succeeding course. Mr. Ketcham.

A consideration of spoken words as an evidence of man's early efforts to store and communicate meanings. Analysis on the basis of word-symbols, word concepts, and real words. The relation of word-concepts to the actuality which they reflect. Possible applications in speech problems of the various relationships between words and consciousness.

950. Research in Speech. Autumn, Winter, and Spring Quarters. Library, conference, and laboratory work. General prerequisites must include acceptable courses in the chosen field of research. The student may spend a part or all of his time on research work.

Research work in speech is done under the direction of those members of the staff in whose field the student's specialization lies.

Given in the Summer of 1943.

SURGICAL RESEARCH

Office, 203 Kinsman Hall

PROFESSOR CURTIS, ASSISTANT PROFESSOR KLASSEN

FOR GRADUATES

900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Surgical Research. All Quarters. Laboratory, dispensary, or clinic, library and conferences. An opportunity for qualified students to investigate surgical principles and surgical diseases. Permission of the instructor is required. Mr. Curtis, Mr. Klassen.

Particular opportunity is offered for the investigation of thyroid diseases, of iodine and calcium metabolism, of certain bone diseases, of gastro-intestinal disease, of the surgical aspects of tuberculosis, and of the pathological physiology of the spleen. The amount of time spent in research varies. At times the student may participate in the current research activities of the staff.

SURVEY COURSES

PROFESSORS EVANS, AVEY, AND SPIEKER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. Prerequisite, permission of the instructor in charge who will decide in each individual case whether the student has had the necessary training to profit from the course.

605. Foundations of Contemporary Civilization. Five credit hours. One Quarter. Autumn, Winter, Spring. Five meetings each week. Mr. Evans, Mr. Avey.

This course is designed for all students majoring in subjects falling within the fields of biological and inorganic sciences, mathematics and psychology. The course deals with the changes of thought in religion, ethics, social and political philosophy in relation to the general intellectual and social changes of modern civilization. It concludes with a brief discussion of the chief problems of our present civilization.

Given in the Summer of 1943.

608. Development of Modern Science. Five credit hours. One Quarter. Autumn and Winter. Five meetings each week. Mr. Spieker.

This course is designed especially for students who have not majored in science. Its purpose is to give the non-science student a general view of the historical development of scientific ideas, and to dwell upon the nature and validity of scientific hypotheses and theories from a scientific point of view. The course is also well adapted to assist the prospective teacher of science in greatly broadening his scientific foundations.

VETERINARY ANATOMY

Office, 204 Veterinary Laboratory

PROFESSOR GROSSMAN, ASSISTANT PROFESSOR WESTERFIELD, MR. MAUGER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

701. Problems in Veterinary Anatomy. Two to five credit hours. One Quarter. Autumn, Winter, Spring.

(a) Special Problems in Veterinary Anatomy. Mr. Grossman, Mr. Westerfield.

This course offers advanced training and instruction in Veterinary Anatomy. The work is carried out as laboratory investigation of special problems.

Not open to students who have credit for Veterinary Anatomy 601.

(b) Histologic Technique. Laboratory work, three hours for each credit hour. Mr. Grossman, Mr. Westerfield, Mr. Mauger.

This course deals with the examination of the tissues with the aid of the microscope. The important methods in the preparatory steps required in collecting specimens, fixation, embedding, sectioning, staining, and mounting are considered.

Students electing this course should confer with the instructor in charge.

Not open to students who have credit for Veterinary Anatomy 608.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Veterinary Anatomy. Autumn, Winter, and Spring Quarters. General prerequisites must include a course in the topographic anatomy of the domestic animals. Permission of the instructor must be obtained before registering for the course. Mr. Grossman.

Opportunity is offered for working on special problems in the anatomy of the domestic animals.

VETERINARY MEDICINE

Office, 103 Veterinary Laboratory

PROFESSORS BRUMLEY AND HOBBS, ASSOCIATE PROFESSOR KRILL

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

701. Special Problems in Veterinary Medicine. Two to five credit hours each Quarter. Autumn, Winter, Spring. Mr. Brumley, Mr. Hobbs, Mr. Krill.

Not open to students who have credit for Veterinary Medicine 626.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Veterinary Medicine. Autumn, Winter, and Spring Quarters. General prerequisites must include acceptable courses in the chosen field of research. Mr. Brumley, Mr. Hobbs, Mr. Krill.
Given in the Summer of 1943.

VETERINARY PARASITOLOGY
Office, 4 Veterinary Laboratory

PROFESSOR REBRASSIER, MR. KOUTZ

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

623. Advanced Veterinary Parasitology. Two to five credit hours each Quarter. Autumn, Winter, Spring. Conference, laboratory, and museum work. Mr. Rebrassier, Mr. Koutz.
A course designed primarily for graduates in Veterinary Medicine who plan to specialize in Veterinary Parasitology. It includes a review of literature, detailed study of classification, morphology, life histories and economic importance.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

826. Special Parasitological Problems. Three to ten credit hours each Quarter. Autumn, Winter, Spring. General prerequisites must include Veterinary Parasitology 623 and permission of the instructor. Mr. Rebrassier, Mr. Koutz.
Given in the Summer of 1943.

950. Research in Veterinary Parasitology. Autumn, Winter, and Spring Quarters. Library, conference, and laboratory work. General prerequisites must include acceptable courses in the chosen field of research. Mr. Rebrassier, Mr. Koutz.

VETERINARY PATHOLOGY
Office, 135 Veterinary Clinic

PROFESSOR GOSS, MR. CASE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

610. Pathology Technique. Two to five credit hours each Quarter. Autumn, Winter, Spring. Laboratory work, three hours for each credit hour. Mr. Goss, Mr. Case.
Practice in the methods of laboratory diagnosis, consisting of collecting the specimens, their fixation and embedding, and the sectioning of such tissues, together with practice in laboratory diagnosis and the recognition of disease processes in tissues.
Given in the Summer of 1943.

615. Advanced Special Pathology. Two to five credit hours each Quarter. Autumn, Winter, Spring. Laboratory work, three hours for each credit

hour. General prerequisites must include Veterinary Pathology 610. Mr. Goss, Mr. Case.

An advanced course in the pathology of infectious diseases with special reference to anatomical and microscopical lesions and methods of diagnosis together with detailed studies of the lesions of specific diseases under consideration.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

801. **Veterinary Pathology.** Three to ten credit hours each Quarter.

(a) **Special Anatomical Pathology.** Mr. Goss.

Special problems in gross and microscopic pathology with regard to the accommodations of the course to particular projects which may be given due consideration.

(b) **Special Bovine Pathology.** Mr. Goss.

This is to accommodate those students doing graduate work in some special field of bovine pathology. The selection of projects is quite variable, allowing for special problems in this field.

Not open to students who have credit for Veterinary Pathology 805.

(c) **Special Poultry Pathology.** Mr. Goss.

This course allows for the study of poultry diseases with specialization in any pathological processes concerned with poultry diseases.

Not open to students who have credit for Veterinary Pathology 815.

Given in the Summer of 1943.

950. **Research in Veterinary Pathology.** Summer, Autumn, Winter and Spring Quarters. Library, conference and laboratory work. General prerequisites must include acceptable courses in the chosen field of research. The individual may spend a part or all of his time on research work. Mr. Goss.

Given in the Summer of 1943.

VETERINARY PHYSIOLOGY AND PHARMACOLOGY

Office, 202 Veterinary Laboratory

ASSOCIATE PROFESSOR ASHCRAFT

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

701. **Minor Problems in Physiology and Pharmacology.** Three to fifteen credit hours. Autumn, Winter, and Spring Quarters. Designed for qualified students who wish to begin research. Permission of department chairman is required for registration. Mr. Ashcraft.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. **Research in Physiology and Pharmacology.** Autumn, Winter, and Spring Quarters. General prerequisites must include courses in comparative physiology or pharmacology, or equivalent courses and the permission of the department chairman. Mr. Ashcraft.

The department is equipped to supervise research dealing with special problems in physiology and pharmacology.

VETERINARY PREVENTIVE MEDICINE

Office, 203 Veterinary Laboratory

PROFESSOR SCHALK, MR. HELWIG

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

701. Special Problems in Preventive Veterinary Medicine. Two to five credit hours. One Quarter. Autumn, Winter, Spring. Mr. Schalk.

Special courses can be pursued in genetics, environmental, biologic and food hygiene.

Not open to students who have credit for Veterinary Preventive Medicine 650.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Research in Veterinary Preventive Medicine. Autumn, Winter, Spring and Summer Quarters. General prerequisites: The applicant should be able to fully satisfy the instructor and department chairman that he possesses adequate interest in and general capability to successfully pursue graduate work in a chosen field of preventive medicine—genetic, environmental, biologic or food hygiene. Mr. Schalk, Mr. Helwig.

VETERINARY RESEARCH

Office, Animal Disease Laboratories, Reynoldsburg, Ohio

PROFESSORS EDGINGTON, BRUMLEY, HOBBS, SCHALK, AND REBRASSIER, ASSOCIATE PROFESSORS KRILL AND BURROUGHS, MR. HELWIG, MR. KOUTZ, MISS FRANK

The departmental laboratories wherein the major portion of the active work is conducted are located near Reynoldsburg, about ten miles from Columbus. Here well-equipped laboratories and facilities for housing and isolation of experimental animals, including poultry, are available. These laboratories represent a focal point for the animal disease investigations of the Veterinary College, Ohio Agricultural Experiment Station, and the Department of Agriculture of Ohio.

The work of the department is of interest primarily to advanced and graduate students, but information regarding various projects under study is available to other courses presented by the College.

The facilities of the department provide ample opportunities for the interested and able veterinary student to pursue a variety of studies under the direction of the staff.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

950. Veterinary Research. Autumn, Winter, and Spring Quarters. General prerequisites must include satisfactory evidence of an interest in and ability to pursue the projects undertaken.

This course is designed to accommodate the needs in different lines of veterinary research. The work will be outlined by the instructor to meet the requirements of the individual student.

While research primarily in the fields of infectious, parasitic, and nutritional diseases is under the supervision of the staff members, Mr. Edgington, Mr. Rebrassier, and Mr. Schalk, other lines of study may be arranged under appropriate leadership. A close working relationship is maintained by the entire staff on all problems under consideration in the department.

Given in the Summer of 1943.

VETERINARY SURGERY AND CLINICS

Office, 115 Veterinary Clinic

PROFESSOR GUARD AND STAFF

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

701. Special Problems in Veterinary Surgery. One to five credit hours each quarter. All Quarters. Mr. Guard and surgical staff.

Advanced work in surgery, gynecology or obstetrics.

Not open to students who have credit for Veterinary Surgery 624.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

810. Advanced Clinical Technique. Three to ten credit hours. All Quarters. A course intended to give the student more intensive clinical experience in one or more of the following divisions of our clinic.

(a) Contagious infectious diseases. Mr. Schalk.
(b) Medical (large animal). Mr. Krill.
(c) Medical (small animal). Mr. Hobbs.
(d) Parasitological. Mr. Rebrassier.
(e) Surgical (large animal). Mr. Guard.
(f) Surgical (small animal). Mr. Knapp.
(g) Dispensary. Mr. Guard and instructor.
(h) Ambulatory. Mr. Guard and instructor.

Permission of department chairman and instructor is required.

950. Research in Veterinary Surgery and Clinical Technique. All Quarters. Laboratory, library and conferences. Qualified students have the opportunity:

(a) To investigate surgical principles, surgical diseases and problems in the fields of roentgenology, gynecology and obstretrics. Mr. Guard and surgical staff.

(b) To pursue intensive study of some particular problem in one or more of the clinical divisions enumerated under course 810. Mr. Guard and clinical staff.

Permission of department chairman and instructor is required.

VOCATIONAL EDUCATION

(See Education)

ZOOLOGY AND ENTOMOLOGY

Office, 101 Botany and Zoology Building

PROFESSORS SNYDER, OSBURN (EMERITUS), OSBORN (EMERITUS), BARROWS, CAMPBELL, DeLONG, PETERSON, KENNEDY, AND PRICE, ASSOCIATE PROFESSORS D. F. MILLER, RIFE, KOSTIR, AND DUNHAM, ASSISTANT PROFESSORS J. A. MILLER, HICKS, DAVIDSON, KNULL, TIDD, BORROR, AND VENARD, MR. J. N. MILLER, MR. GREEN, MR. DAMBACH, MR. HUTZEL

Requirements for Advanced Degrees: In addition to the fixed requirements of the University, the Department of Zoology and Entomology requires that the candidate for the Master's degree shall have had, at the time of the comprehensive examination, fundamental training in the following subjects: organic or biological or agricultural chemistry, botany and any three of the following groups: anatomy or vertebrate zoology, invertebrate zoology, embryology, or genetics, plant or animal physiology, plant pathology or bacteriology. Additional requirements in the special field in which the degree is taken will be indicated by the adviser. The candidate for the Doctor's degree, in addition to the fixed requirements of the University and all of the groups indicated above, shall have had at the time of the comprehensive examination, a fundamental knowledge of the following subjects: college algebra and statistics, physics, ecology and geology or evolution, besides familiarity with the current literature. Additional requirements in the special field of research will be indicated by the adviser.

ZOOLOGY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

601. Advanced Human Heredity. Three credit hours. Autumn Quarter. Three lecture-discussion periods each week. General prerequisites must include a course in principles of heredity and permission of the instructor must be obtained. Mr. Snyder.

This is a study of human inheritance, with especial emphasis on the methods of research in this branch of genetics. The mathematical analysis of human pedigrees is intensively studied.

†**602. Advanced Genetics.** Three credit hours. Winter Quarter. Three lecture-discussion periods each week. Given in alternate years. General prerequisites must include a course in principles of heredity and permission of the instructor. Mr. Rife.

A study of recent advances in genetics, with special reference to chromosomal aberrations. The interaction of heredity and environment in man is discussed particularly from the standpoint of the study of twins.

Given in the Summer of 1943.

605. Animal Behavior. Three credit hours. Autumn Quarter. One lecture each week, the remainder laboratory work. Given in alternate years. Permission of the instructor is required. Mr. Barrows.

This course is devoted to the study of the functions of the various parts of the nervous system of the invertebrates, with emphasis on the mechanics of adjustment to heat, light, chemical, and mechanical stimuation. Considerable time will be spent on experiments with living worms and insects.

Given in the Summer of 1943.

*606. **Animal Behavior.** Three credit hours. Winter Quarter. One lecture each week, the remainder laboratory work. Permission of the instructor is required. Given in alternate years. Mr. D. F. Miller.

This course is devoted to the study of the responses of insects to the stimulating factors of their environment. These studies are directed toward the types of behavior which are important in insect control.

609. Animal Microtechnic. Three or five credit hours. Autumn Quarter. A laboratory course. Laboratory work, assigned readings, and conferences. This course is designed for students intending to major in one of the biological sciences. The class is limited to twelve students and permission of the instructor must be obtained before registering for the course. Mr. Kostir, Mr. J. N. Miller.

Theory and practice of microscopic methods, including fixing, embedding, sectioning, and staining of animal tissues, making permanent preparations, and special manipulation of the microscope and its accessories.

Given in the Summer of 1943.

610. Animal Parasites. Five credit hours. Winter Quarter. Two lectures and three two-hour laboratory periods each week. Mr. J. N. Miller.

This course covers the general principles of parasitology, the morphology, life history, and classification of parasites, and their host relationships. Recommended for students preparing for medical or zoological work.

Not open to students who have credit for Zoology 504.

617. General Cytology. Three to five credit hours. Winter Quarter. Three lectures and two two-hour laboratory periods each week. Permission of the instructor must be obtained before registering. Mr. Kostir.

A study of protoplasm, the organization of living cells, and the fundamental phenomena of life.

* Not given in 1943-1944.

† Not given during the academic year, 1943-1944.

618. The Cytological Basis of Genetics. Three or five credit hours. Spring Quarter. Three lectures and two two-hour laboratory periods each week. General prerequisites must include a course in heredity. Zoology 617 is desirable, but not essential. Permission of the instructor must be obtained before registering for this course. Mr. Kostir.

A study of chromosomes and chromosomal mechanism of heredity, variation, and evolution.

620. Advanced Zoology of Vertebrates. Five credit hours. Spring Quarter. Three lectures and two two-hour laboratory periods each week. General prerequisites must include elementary courses in zoology. A course in evolution and one Quarter in comparative anatomy are also desirable. Mr. Price.

A study of the various vertebrate groups, emphasizing their origin, phylogeny, classification, life histories, habits, distribution, and economic importance. Laboratory, museum and field work. Especially recommended for students specializing in biological science.

625. Advanced Zoology of Invertebrates I. The Protozoa. Five credit hours. Autumn Quarter. Two lectures and three two-hour laboratory periods each week. General prerequisites must include elementary courses in zoology. Mr. Kostir.

Zoology 625, 626, and 627 are fundamental courses designed to give the student a general knowledge of the structure, life histories, habits, and relationships of the invertebrate animals. While it is preferable that these courses be taken in the order given, this is not essential, and any one of the three may be elected independently of the others. Course 625 deals with the protozoa, including both free-living and parasitic forms.

626. Advanced Zoology of Invertebrates II. Five credit hours. Winter Quarter. Two lectures and three two-hour laboratory periods each week. General prerequisites must include elementary courses in zoology. Mr. Kostir.

A study of the structure, life histories, habits and relationships of sponges, coelenterates, worms, and arthropods, together with the consideration of important biological principles illustrated by these groups. Note statement under Zoology 625.

627. Advanced Zoology of Invertebrates III. Five credit hours. Spring Quarter. Two lectures and three two-hour laboratory periods each week. General prerequisites must include elementary courses in zoology. Mr. Kostir.

A study of the structure, life histories, habits and relationships of molluscs, echinoderms, brachiopods, and bryozoa, together with the consideration of important biological principles illustrated by these groups. Note statement under Zoology 625.

630. The Interpretation of Biological Data. Three credit hours. One Quarter. Autumn and Winter. Two lectures and one two-hour laboratory period each week. General prerequisites must include advanced standing in biological science and permission of the instructor must be obtained. Mr. Green.

An introductory course in bio-statistics. For the general biological student who may not anticipate extensive use of statistical methods the aim will be to develop an appreciation of the general principles of statistical inference and to indicate the historical connections between the study of statistics and the study of biological variability. The consistent use of "small sample" statistics will serve to prepare the research student for advanced work in biometry.

640. Wildlife Conservation. Five credit hours. Winter Quarter. Five lectures each week. Given in alternate years. General prerequisites must include thirty hours of biological sciences, and permission of the instructor must be obtained. Mr. Dambach.

An introduction to the field of wildlife conservation. Value of wildlife resources, relation to other natural resources, agriculture, forestry and recreation, wildlife economics, land utilization contributions, conservatism fundamentals, research and field techniques, ecology of game and non-game species, role of vegetation in habitat developments, interrelationships of species, management methods, demonstrations, utilization, administration, education and public relations, history of wildlife conservation, wildlife conservation organizations or institutions, and personnel entrusted with custody of wildlife resources today.

***641. Methods and Techniques in Wildlife Management.** Five credit hours. Winter Quarter. Two lectures and two three-hour laboratory periods each. General prerequisites must include thirty hours of biological science and

* Not given in 1943-1944.

permission of the instructor must be obtained. Given in alternate years. Mr. Dambach.

A study of research and field techniques, correlated with field and laboratory work in wildlife conservation, including demonstrations and reviews of pertinent literature. Consideration will be given to methods of collecting and preserving biological specimens, field analyses of animal populations, proper use of commonly used types of field equipment, census methods, trapping techniques, mapping and establishment of study areas, food habits analyses, tagging and marking animals, methods of collecting, storing and planting food and cover plants, interpretation of animal signs in the field, control methods and miscellaneous techniques.

643-644-645. Wildlife Conservation Conference. One credit hour. Autumn, Winter, and Spring Quarters. General prerequisites must include thirty hours of biological science and permission of instructor must be obtained. Mr. Hicks, Mr. Dambach.

Review of research, discussion of assigned subjects, problems encountered, research methods, current literature, etc. Reports on subjects related to wildlife conservation by staff members of various departments and addresses by visiting wildlife technicians, research workers, educators and administrators.

701. Special Problems. Three or five credit hours each Quarter. Autumn, Winter, Spring. A student may enter at the beginning of any Quarter. General prerequisites must include satisfactory preparation for individual work in the field of the chosen problem. The student may have free choice of the instructor under whom he desires to work, but the permission of the instructor must be obtained before registering for the course. The staff.

Given in the Summer of 1943.

NOTE: TEACHING COURSES. For the Teaching Course in this department see the Department of Education, Course 683.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

These prerequisites include an adequate knowledge not only of zoology but also of related sciences. It is desirable that the student should have a reading knowledge of French and German.

808. Comparative Embryology. Five credit hours. Autumn Quarter. Three lectures and two two-hour laboratory periods each week. Open to graduate students with the consent of the instructor. Mr. Price.

A survey of various modes of embryonic development, illustrated with both invertebrate and vertebrate types. Emphasis is placed on fundamental aspects and processes of development. Both descriptive and experimental methods will be used in the laboratory work.

815. The Statistical Design of Biological Experiments. Five credit hours. Winter Quarter. Three lectures and two two-hour laboratory periods each week. Zoology 630 or its equivalent must be included in the prerequisites or taken concurrently. Permission of the instructor must be obtained. Mr. Green.

An intensive study of the application of the methods of "analysis of variance and covariance" to a wide variety of biological problems. Special attention will be paid to questions of experimental arrangement and special topics in advanced biometry will be reviewed.

950. Research in Zoology. Autumn, Winter, and Spring Quarters. Mr. Snyder, Mr. Barrows, Mr. DeLong, Mr. Peterson, Mr. Kennedy, Mr. Kostir, Mr. Price, Mr. D. F. Miller, Mr. J. A. Miller, Mr. Tidd, Mr. Borror, Mr. Venard.

Problems in development, life history, morphology, ecology, genetics, animal behavior, parasitology, taxonomy, or other zoological or entomological subjects may be undertaken. For some of these the opportunities are particularly good in summer at the Biological Laboratory. Students interested should send for the Franz Theodore Stone Laboratory Bulletin.

Given in the Summer of 1943.

ENTOMOLOGY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

†650. **Entomology for Biology Teachers.** Five credit hours. Three lectures and two two-hour laboratory periods each week. Mr. Kennedy.

The course deals with the economic importance of insects, their general characteristics, morphological structure, metamorphosis, and control. A survey of the orders and families of insects with special emphasis on the biology and ecology of the most important families. The laboratory will consist of studies of the most important insect groups, how to make an insect collection, preparation of killing bottles, preserving insects for study, culturing insects for class use and for class demonstrations. Recommended especially for biology teachers or to students who desire a general knowledge of insects.

Given in the Summer of 1943.

651. **Advanced Entomology.** Five credit hours. Autumn Quarter. Two lectures and three two-hour laboratory periods each week. Mr. Kennedy.

This course deals with the comparative external morphology, the evolutionary history and classification of insects; laboratory work is systematic and material will be furnished, but it will be preferable if the student collects and pins material for himself during the summer preceding.

Given in the Summer of 1943.

652. **Advanced Entomology.** Five credit hours. Winter Quarter. Two lectures and three two-hour laboratory periods each week. General prerequisites must include two Quarters of zoology and two Quarters of entomology or other biological science. Mr. Kennedy.

This course deals with insect behavior, life histories, and particularly with ecological principles governing occurrence and distribution of insect species, and the principles underlying insect control. The laboratory work is systematic.

653. **Chemical Control of Insect Pests.** Five credit hours. Autumn Quarter. Three lectures and two three-hour laboratory periods each week. General prerequisites include elementary courses in zoology and in general and economic entomology, or equivalent. A background of training in physics and quantitative chemistry is desirable. Mr. Hutzel.

These courses deal primarily with insecticides—their properties, toxicology, relative value, and use. Stomach and contact insecticides are studied.

654. **Chemical Control of Insect Pests.** Five credit hours. Spring Quarter. Two lectures and two three-hour laboratory periods each week. General prerequisites must include elementary courses in zoology and in general and economic entomology or equivalent. A background of training in physics and quantitative chemistry is desirable. Mr. Hutzel.

Fumigation and other control measures are studied.

655. **Insects in Relation to Disease.** Three or five credit hours. Winter Quarter. Three lectures each week. Students who register for five credit hours will have two two-hour laboratory periods in addition. General prerequisites must include introductory courses in zoology, also it is advisable to have had beginning courses in entomology, bacteriology, and animal parasites. Mr. Venard.

This course gives students in animal husbandry, bacteriology, medicine, veterinary science, and others an opportunity to become familiar with the recognition characteristics, habits, and controls of immature and adult insects, ticks, mites, and other arthropods that attack man and domestic animals. Considerable attention is paid to those species that transmit various diseases of man and animals. Especially recommended for premedical students.

658. **Insect Ecology.** Five credit hours. Autumn Quarter. Three lectures and two two-hour laboratory periods each week. Mr. DeLong.

A study of the environmental factors under which insects live and their relationship to the production of insect populations and control phases. This involves the study of climate, the

† Not given during the academic year, 1943-1944.

relationship of temperature, humidity, precipitation, and evaporation to biology of insects, the problems of hibernation, aestivation, and such applied problems as the effect of cropping, rotation, and cultivation upon the development of insect populations.

*660. Entomological Literature and Principles of Taxonomy. Five credit hours. Winter Quarter. Given in alternate years. Mr. Kennedy.

Lectures on the development of entomological writing, studies of Government and Experiment Station bulletins and other publications, assigned readings, and preparation by each student of a report or review upon some publication. Intended to familiarize the student with past and current publications and give him command of the published records in his field of study.

A study of the principles of classification with lectures on taxonomic systems, codes of nomenclature, etc. Practical work in the classification of a selected group or groups of insects or other animals.

662. Household Insects. Three credit hours. Spring Quarter. Two lectures and one two-hour laboratory period each week. Mr. Hutzel.

A study of the characteristics, biology, and control of insects that annoy man or damage his buildings or goods therein. The course is also intended to acquaint the students with present practices and future possibilities of the pest control industry. Field trips will be made to observe the work of local pest control operators.

Not open to students who have credit for Entomology 562.

665. Immature Insects. Three or five credit hours. One Quarter. Autumn and Spring. One lecture and two or four two-hour laboratory periods each week. General prerequisites must include Entomology 651 and 652 or equivalents. Mr. Peterson.

This course gives a student an opportunity to become familiar with the characters used in determining families, genera and species of immature stages of insects, especially larvae. The laboratory work deals primarily with the determination of larvae. Library and field work are included. A student collection of immature stages of insects determined to families is required. Topics such as external morphology of immature insects and methods of collecting, killing, preservation and preparation of material are discussed.

666. Horticultural Entomology. Five credit hours. Spring Quarter. Three lectures and two two-hour laboratory periods each week. Mr. Davidson.

Designed for students specializing in the department of Horticulture.

A study of the characteristics, biology, ecology, and control of the insect pests attacking ornamental shade trees and shrubs; orchards and small fruits; and vegetable and greenhouse crops. Field and laboratory studies will be made on recognition of types of injury, the stages of the insect causing it, and the preparation and application of the proper remedial measures.

701. Special Problems. Three to five credit hours each Quarter. Autumn, Winter, Spring. A student may enter at the beginning of any Quarter. General prerequisites must include satisfactory preparation for individual work in the field of the chosen problem. The student may have free choice of the instructor under whom he desires to work, but the permission of the instructor must be obtained before registering for the course. The staff.

Given in the Summer of 1943.

FOR GRADUATES

800 and 900 Courses. A statement of the general prerequisites for all courses in this group will be found immediately following the heading, "DEPARTMENTS OF INSTRUCTION," page 45.

814. Biological Control of Insect Pests. Five credit hours. Winter Quarter. Four lectures and one two-hour laboratory period each week. Open to graduate students with the consent of the instructor. Mr. Peterson.

An advanced course dealing with the biological agents which help to bring about a balance or control of insects. The topics considered are diseases of insects, vertebrate and invertebrate predators and insects parasitic on or within insects. The laboratory work consists largely of special assigned problems and library work.

816. Research Methods: Living Insects. Five credit hours. Spring Quarter. Three lectures and two two-hour laboratory periods each week. Open

* Not given in 1943-1944.

to graduate students with the consent of the instructor. It is advisable to have Entomology 658, 651 and 652 before taking this course. Mr. Peterson.

A course designed for the purpose of introducing students to methods and equipment employed today by research entomologists in their studies of living insects. Particular attention is paid to the equipment and methods employed in measuring environmental factors under laboratory and field conditions. Also, methods of rearing insects, methods of conducting life history studies, trapping insects, sampling and other information useful for entomologists now in or preparing to enter field research work are discussed. A portion of the laboratory work consists of special assigned problems.

817. Morphology and Development of Insects. Five credit hours. Autumn Quarter. Two lectures and three two-hour laboratory periods each week. Mr. Kennedy.

An advanced comprehensive course on the internal structures of insects, together with what is known of their functions, morphology, histology, embryology, and metamorphosis. The laboratory is handled as an individual research problem for each student and may be continued in succeeding Quarters as research.

The success of this work depends on the material collected and preserved by the student preceding the course. Methods for collecting and preserving material should be taken up with the instructor in charge at the end of the Spring Quarter preceding. Students coming from other institutions are expected to write for instructions.

818. Advanced Course on Immature Insects. Three or five credit hours. Winter Quarter. One conference hour and two or four two-hour laboratory periods each week. General prerequisites must include Entomology 665 or its equivalent. Mr. Peterson.

This course is designed to give graduate students an opportunity to become familiar with the immature stages of special groups of insects. So far as possible determination to species in the groups selected will be made. Some of the groups available for study are among aquatic insects, larvae of mosquitoes, midges, dragon flies and others; and among terrestrial groups, larvae of noctuids, tortricids, pyralids, elaterids, cerambycids, tenthredinids and others. Library work is expected.

850. Insect Physiology. Five credit hours. Winter Quarter. Two lectures and two three-hour laboratory periods each week. The instructor must be consulted before registering. Mr. Hutzel.

This course will be confined to quantitative aspects of insect physiology, dealing chiefly with the results of laboratory investigations on the chemistry of insect structures, body contents, and products, and on digestion, blood excretion, respiration, nutrition, and growth. The relations of insect physiology to the chemical control of insects will be stressed.

950. Research in Entomology. Autumn, Winter, and Spring Quarters. Mr. Barrows, Mr. Peterson, Mr. DeLong, Mr. Kennedy, Mr. D. F. Miller, Mr. Campbell, Mr. Davidson, Mr. Hutzel.

Problems in development, life history, morphology, ecology, genetics, animal behavior, parasitology, taxonomy, or other zoological or entomological subjects may be undertaken. For some of these the opportunities are particularly good in summer at the Biological Laboratory. Students interested should send for the Franz Theodore Stone Laboratory Bulletin.

Given in the Summer of 1943.

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Graduate School

College of Agriculture

Junior School of Agriculture

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Fine Arts

Music

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College of Medicine

School of Nursing

College of Pharmacy

College of Veterinary Medicine

Annual Report

Franz Theodore Stone Laboratory (Formerly Lake Laboratory)

General Catalogue Number*

Information for Prospective Students

Summer Quarter

Time Schedule

University Directory*

Short Courses in Agriculture

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